

In This Issue—*Flat Rate as a Car Selling Aid*

OCT 20 1922

MOTOR AGE

Vol. XLII
Number 16

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, OCTOBER 19, 1922

Thirty-five Cents a Copy
Three Dollars a Year

A dealer who sold one hundred and fifty cars of one make lost money.

But he happened to have the Jordan and sold forty of these. His profits on the Jordan saved his business.

I have a letter which covers about four pages which will tell you all the reasons for this.

If you are a dealer, and you expect to continue to be a dealer, you may be progressive enough to want a copy of this letter. Just send me a postal or a telegram and you will get the letter.

Edward Jordan

Why Buy an Electric Drill?

666 USES FOR PORTABLE ELECTRIC DRILLS IN AUTOMOTIVE REPAIR SHOPS

The inside pages of this folder contain a composite list of uses made up from Portable Electric Drills in the Automotive Repair Shop, in the BLACK & DECKER PRIZE CONTEST.

(Except in the correction of submitted works or corrections, promotional efforts are being made to make the uses more representative.)

WINNERS OF THE BLACK & DECKER PRIZE CONTEST

First Prize:—Concourse Auto Repair Co.,
BLACK & DECKER
1206 Grand Concourse, near 183rd St.,
New York City.

Second Prize:—Nickel's Car and Machine Shop,
BLACK & DECKER
Specialty Portable Electric Drill
Concord, Illinois.

Tied for Third Prize:—Price awarded to both.
BLACK & DECKER
1/4" Portable Electric Drill
Thomas Garage Company,
Carrollton, Ky.
Lee County Motor Repair Co.,
Jackson & Anderson Ave.,
Fort Myers, Fla.



THE BLACK & DECKER MFG. CO.
Towson Heights, Baltimore, Md., U.S.A.

WRITE
FOR
FREE COPY

The Black & Decker Prize Contest showed that there are 666 Uses for Portable Electric Drills in Automotive Repair Shops.

A list of these has been printed as reproduced above. This list constitutes a valuable drilling manual for automotive repair men and will be supplied free on request.

THE BLACK & DECKER MFG. CO.
Towson Heights, Baltimore, Md., U.S.A.

**"The Well-Equipped Shop
Gets the Business"~**



MOTOR AGE

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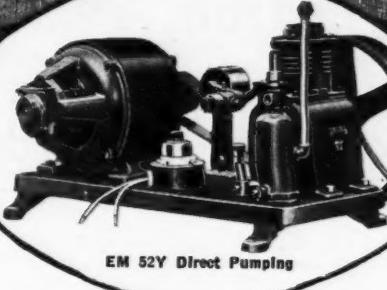
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Free Air



EM 52Y Direct Pumping

KELLOGG
COMPRESSORS

Costs Less to Buy
Less to Run

EM 52Y—an economy outfit. Beyond compare for pumping air for gasoline filling stations. Will inflate from 28 to 60—3½ inch tires from 0 to 50 lbs. pressure for the cost of 1 cent in electrical consumption. The number depending upon the rate per kilowatt hour. Complies with every city and state ordinance without the necessity of tank inspection.

Pumps direct. You save both on initial cost and operating expense. No tank to buy—tank is not needed in filling station service. Only tire pressure to pump against and pump is in operation only when inflating a tire.

From one to four air lines attached if necessary always pumping Free From Oil Air.

Investigate this direct pumping outfit before you buy.

KELLOGG MFG. COMPANY
ROCHESTER, NEW YORK



Operates only when hose is removed from switch at service point.

This attractive steel sign, colors orange and black, sent with every compressor outfit.

KELLOGG
PUMPED
FREE FROM OIL

FREE AIR
KELLOGG
COMPRESSORS
FREE FROM OIL

In Jamaica, N. Y.—

"We formerly handled no less than five different makes of automobiles—all standard makes—and can honestly say that we never knew what real business was until we took on the Olds line one year ago last January. And this considering we handled the other cars during what was conceded to be the best period—1918 to 1920. One reason that we have made some real money is the fact that it has been necessary to give so little service on Oldsmobile cars in general—for instance on the Model 47 it is not worth while mentioning. Long live the Oldsmobile!"

—SCHMIDT & KASTNER MOTOR CO.

R. Schmidt

Can you say the same thing about the line you handle? Do you feel that you've made a friend with every car you sell?

And do your customers stay sold without a lot of gratis service? Is your present connection a happy one? Are you proud of it?

It's a good thing occasionally to take an inventory of your contract just as you take a periodic inventory of your parts department. If the count isn't satisfactory it's time to look around.

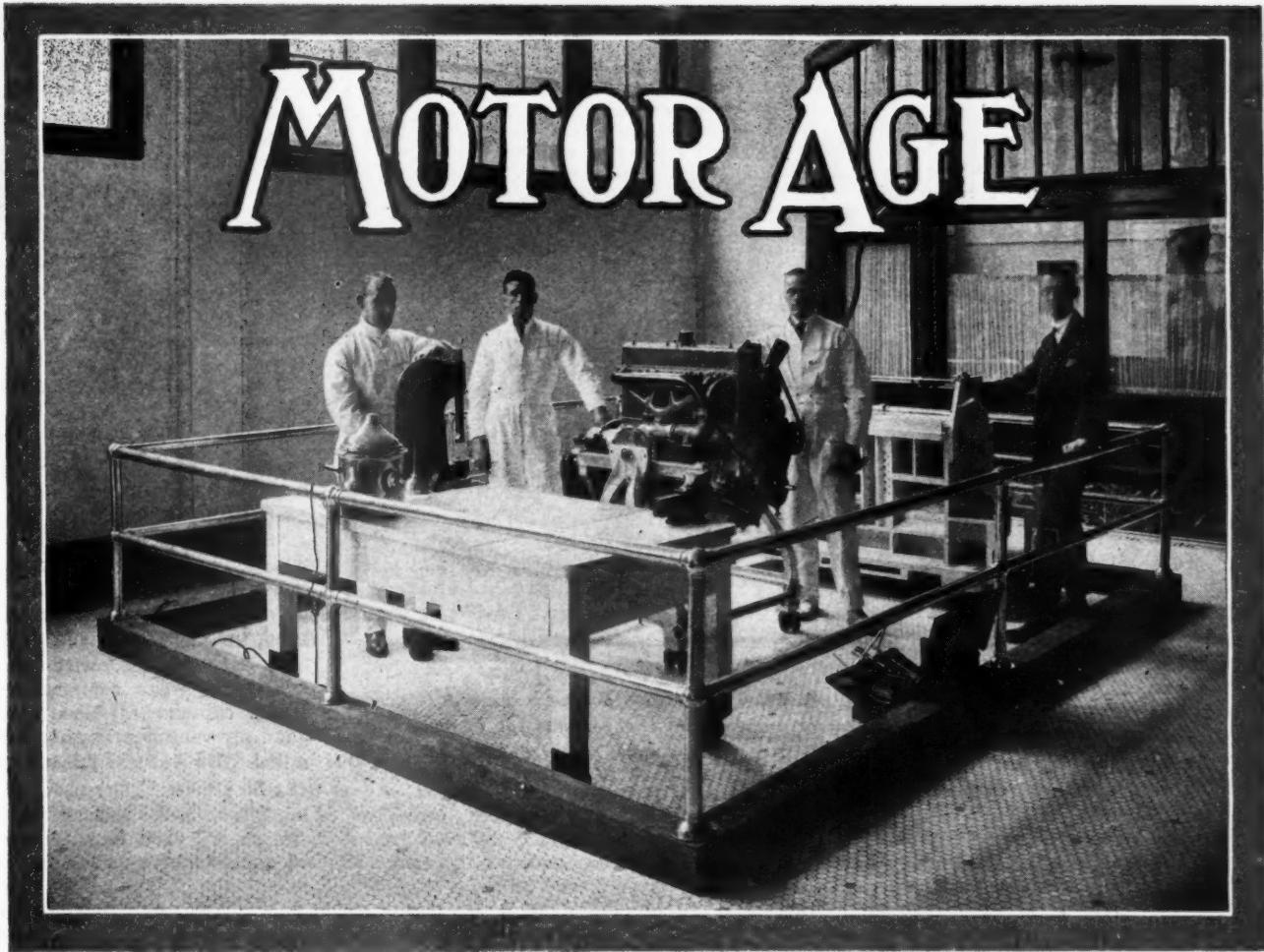
Be an Oldsmobile dealer and you have a complete line of famous cars with a wide price range, with one factory connection, one deposit, one parts account, one advertising message, and with the privilege of using the strong General Motors financing plan which has no equal in the help and cooperation given the dealer.

If you want this kind of a factory contract, communicate with us at once—don't hesitate because you think the territory may not be open. We may have plans which will give you just the opening you want.

The first step is yours—write, wire, or phone.

OLDS MOTOR WORKS, LANSING, MICHIGAN
Division of General Motors Corporation

Oldsmobile
FOURS and
EIGHTS



"Tear-Down" display by Butler-Veitch, Inc., of San Francisco, used as a selling argument in connection with the flat-rate service they have adopted for the cars they sell

Flat Rate System of Selling Maintenance As an Aid to Selling Cars

These Distributors Regard the Flat Rate System as the Greatest Advance They Have Made in Merchandising

The flat rate system of selling maintenance and repairs makes a friend out of the customer.

It helps to sell new cars, on which flat rate operations are guaranteed.

It sells used cars on which the flat rate is part of the sale.

It supplies a long list of reliable prospects.

It increases greatly the volume of repair business.

THese are the five things which Butler-Veitch, Inc., of San Francisco, Pacific coast distributors of the Marmon cars and Fageol trucks, found out about the flat rate system by giving it a fair trial.

The company put in the flat-rate service as a test. They admit it is not complete, for there are still some more operation costs to be worked out, but, incomplete

as it is, they regard it as the greatest advancement they have made, in merchandising as well as in repair-shop business.

They believe that, with ultimate cost fixed, just as first cost is fixed, hundreds of thousands of men, who do not now own automobiles because they have thrifitly feared the uncertainties of maintenance expenses, will buy cars. Before they adopted the flat-rate standard, they saw constantly that the cost of operating and maintaining automobiles varied in an astonishingly wide, strange and unbusinesslike manner. As pioneers in the field on the Pacific coast, they have put on the Marmon standardized service which furnishes to the motorist a definite price for every maintenance operation and they believe, as a result of their trial of the system, that the future success or failure of the auto-

mobile dealer and distributor rests largely on his ability to offer and maintain standardized service at fixed rates.

Here is what Butler says of the experiment:

"The results we have obtained from the installation of standardized service at fixed charges have been felt throughout the business. New car sales, used car sales, prospect lists, repair shop, and all the agencies have shared in the beneficial effects.

"When the automobile dealer or distributor establishes the cost of upkeep and maintenance of the car he sells, so that the customer knows, not merely what his first cost is going to be, but what he is going to have to pay per mile for transportation and what it is going to cost him to keep his car in good running order all the days of its life, that dealer has made a permanent and invaluable friend of that motorist. He has virtually taken that customer into the organization and made him a salesman for that car, provided his standardized service charges are honest, his work on the level and his calculations of time required for repairs accurate.

"The American people are beginning to realize that the first cost of an automobile is really the least important consideration, and that the ultimate cost is the vital thing. When the automotive merchant establishes the fixed ultimate costs on the automobile he sells, he has taken the first and greatest step in bringing to his salesrooms the most valuable of all customers—the reliable, thoughtful, trustworthy man who, when he buys an automobile, realizes that he is buying transportation.

"Already, automobile prospects are seeking out the dealer who offers this fixed flat-rate maintenance. The prospect believes, probably rightly, that the car on which the dealer can make this flat rate for service, is more apt to run uniformly, to have longer life, to give greater service, and to require

Date _____ 192	
<i>You Marion car No. _____ will be due for its monthly inspection on _____ 192. Please bring or send it to our service station at Van Ness and Geary Streets before noon on that day.</i>	
<i>There is no charge for this inspection or for minor adjustments.</i>	
<i>You will be advised of the nature and cost of any charge work necessary and such work will only be done on your order.</i>	
<i>Please fill in the attached card notifying us that your car will come in at the time specified or in case this appointment is inconvenient please state when it will be here.</i>	
BUTLER-VEITCH Inc.	
Service Manager	
BUTLER-VEITCH Inc.	
Gentlemen:	
<i>I will have my car in your service station for monthly inspection on _____ 192 at _____ M</i>	
Signed _____	
Address _____	
Telephone _____	

Monthly inspection, return postcards are sent to every customer and definite engagements for inspection or repair work are made

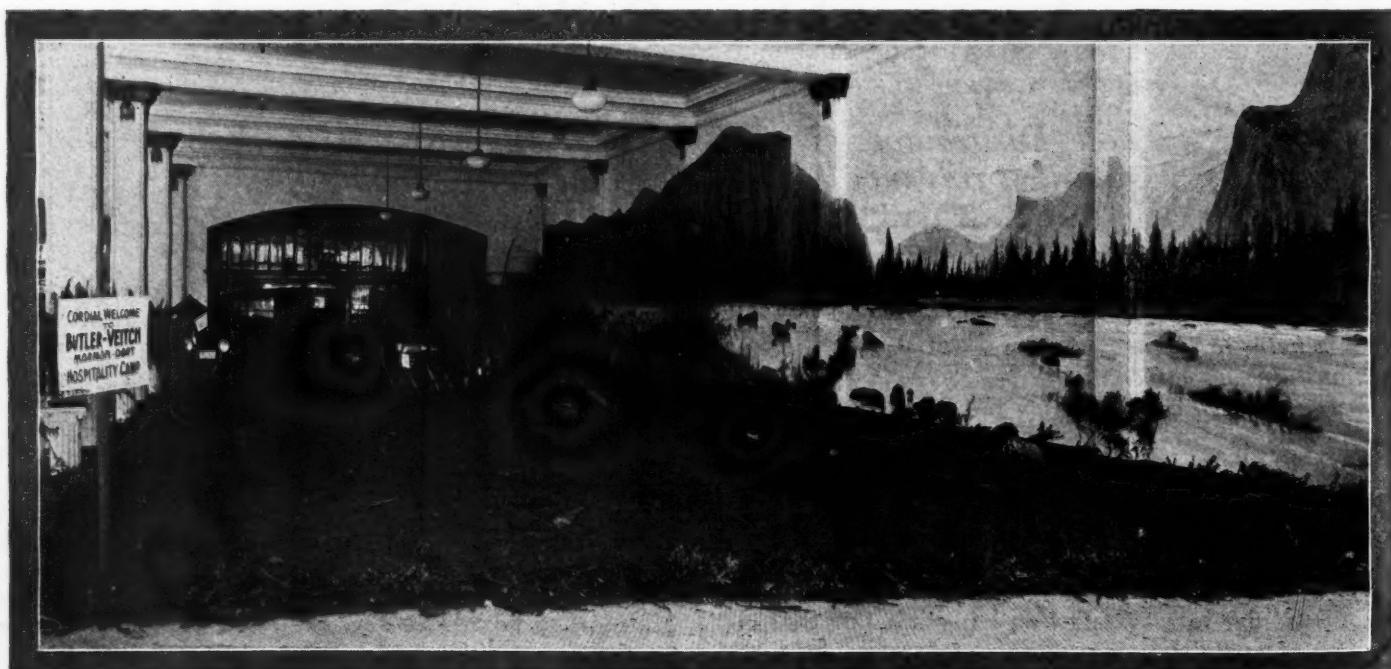
fewer repairs, than cars on which the flat rate has not been placed. Right or wrong, this opinion of the customer, or of the prospective customer, is today a big factor in overcoming sales-resistance in the automotive industry.

"This flat-rate system, too, enables the owner of a 1920, 1921 or 1922 model of the car on which it is given, to keep his car in first-class condition longer, at less expense, than he possibly could have done under the old hit-and-miss system of repairs and upkeep costs. It reduces the number of trade-ins, for the used-car owner—and every car is a used car the minute it leaves the dealer's hands—realizes that his car is worth its second-hand value, minus what it would cost to put in condition.

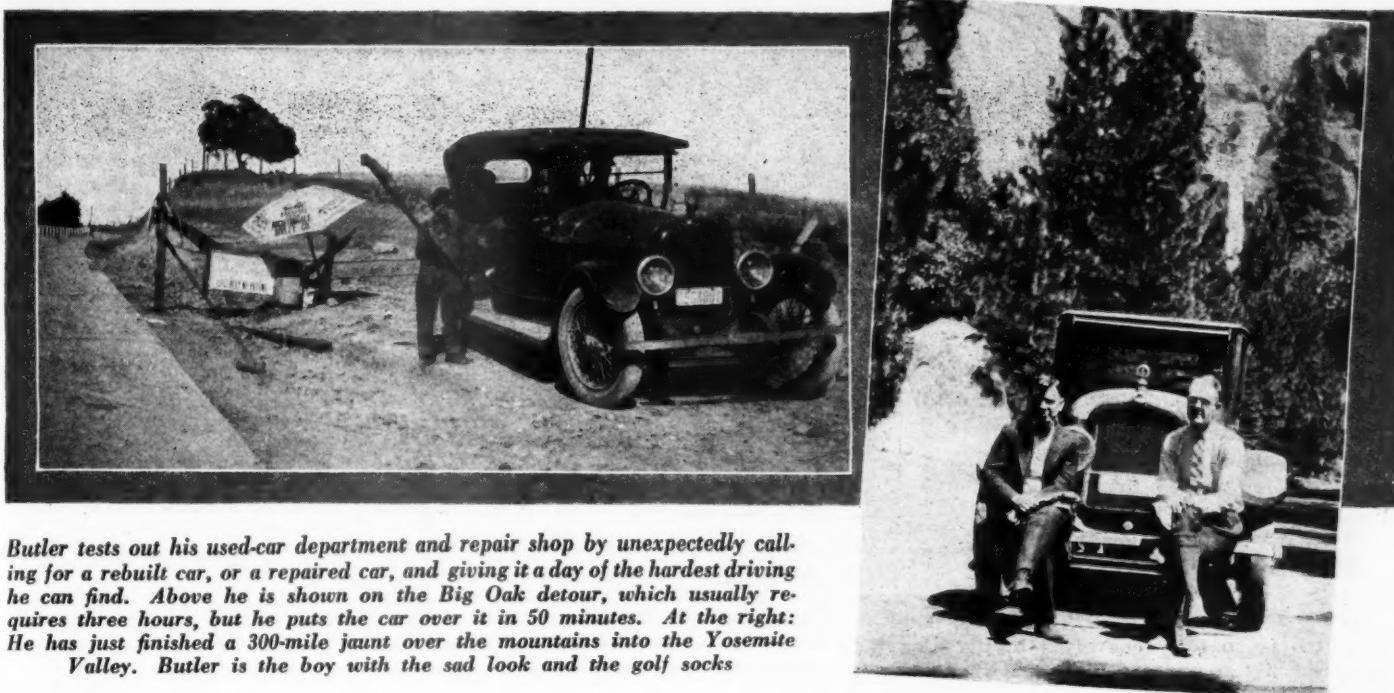
"Suppose a motorist has a car which has run 50,000 miles and needs rebuilding. He knows that at our fixed rate, that rebuilding, here in San Francisco, will cost him exactly \$295, with all parts subject to wear replaced and the whole car in first-class condition, good for very nearly another 50,000 miles. He values, let us say, his car at \$1000. If the used car dealer's appraiser agrees with him, the motorist will receive \$1,000, less \$295, or \$705 for a car, which, for \$295, he could have put in condition to furnish him adequate transportation for another 50,000 miles.

"Today, this motorist does not trade in his used car as a rule; he has it rebuilt, at a cost which he knows in advance and knowing that the work will lay up his car for 4 days. Thus, automatically, this service tends to stabilize the used-car problem, for if the buyer of a new car is worried about his upkeep and maintenance costs, the motorist who has used his car for 30,000 to 50,000 miles is still more worried about them.

"Automatically, also, this flat rate speeds up the used car business, for the man who cannot afford a new car at \$3,000 or more, will buy a car of the same model which has been re-



Half of the show and salesroom of Butler-Veitch, in San Francisco, during "Call of the Open Road Week," when special attention was paid, as a sales argument, to standardized service in connection with long touring trips



Butler tests out his used-car department and repair shop by unexpectedly calling for a rebuilt car, or a repaired car, and giving it a day of the hardest driving he can find. Above he is shown on the Big Oak detour, which usually requires three hours, but he puts the car over it in 50 minutes. At the right: He has just finished a 300-mile jaunt over the mountains into the Yosemite Valley. Butler is the boy with the sad look and the golf socks

built under the flat-rate system and guarantees, knowing just what he can get out of the car, just what upkeep costs he may expect, exactly what repairs he will have to have made, and, approximately, the dates at which they will be due. He knows what he is buying when he buys a used car with the standardized service agreement.

"The flat-rate repair system lays before the man who is about to buy an automobile the fact that he can better afford to buy a comparatively high-priced car with this flat-rate standardized service agreement, than he can to buy a car at half the price, which he will have to replace with another new car, long before the standardized-serviced car has begun to deteriorate. This brings the new-car buyer to the salesroom of the dealer who gives standardized service.

"We have seen it work out to this end in more than 100 separate cases since we undertook flat-rate repairs and upkeep. As soon as a customer buys a car from us, whether it be new or second-hand, we put him in the permanent file, and each month we send him a postcard, with a return card attached, both stamped, asking him to bring in his car for regular monthly inspection and for minor adjustments, for which there is no charge.

"If there is any work needed on the car, or any parts replacements necessary, our repair men inform the owner. They do not urge him to have the work done; they merely tell him of conditions inside his car, and leave the orders to him. He looks in the flat-rate booklet we gave him when he bought his car and knows at once just what each operation will cost and how long he will have to leave the car in the shop.

"This feature alone is worth all the work and time necessary to the installation of the flat-rate system for it removes from the mind of the motorist that thought which is constant among all automobile owners, that garage and service station and repair shop charges are excessive, extremely variable, and that most repair-shop men attempt to charge 'all the traffic will stand' regardless of the actual amount of work done or of time spent on the job.

"Thus, the flat-rate system brings work to the repair shop. It is true that we offer the standardized service only on the Marmon, the car we sell, and dealers in other makes of cars when they adopt the flat rate, as they must sooner or later, doubtless will offer it only with the cars they sell. Thus, again automatically, the service brings each kind of car to the shop where it should go, the shop which sells it, and where the repair-men and mechanics should know best how to care for that particular automobile. This, I believe, is desirable, but it brings me to another point.

"We are encouraging outside shops—especially the garages and shops which are not operated by dealers, and more especially shops in out-of-the-way places on the highways—to adopt the flat-rate system for Marmons. To aid the shop-men who are doing this, we are furnishing supplies for Marmons to them, so that they can give the standardized service on every one of the sixteen operations for which we offer it.

"This also has another beneficial angle in that it puts the rate-cutting shops out of business. The man who cuts rates on automobile repairs simply must 'make it up' somewhere, and nine times out of ten he makes it up by overcharging time, by doing poor work, or by putting in inferior material. The flat-rate, coupled with material supplied for each make of car by the distributor for that car, compels the repair man to install the equipment and the parts for which he is paid by the motorist, at a rate which the motorist knows when he buys the car."

The Butler-Veitch corporation also seems to have worked out a new system for the disposal of used cars. A limit is fixed on the amount to be expended in taking in second-hand automobiles. This keeps every salesman on his toes to sell whatever used-cars there may be in the shop. Every used car is rebuilt, the Butler-Veitch guarantee is put back of it, and the rebuilt Marmons are given the benefit of the flat-rate service agreement, so that the buyer of a used car, as well as the purchaser of a new one, knows just what his upkeep, repairs and maintenance will cost him.

They tried the plan of having every salesman dispose of the used-cars he took in, but it failed and was discarded, so that now the sales force is allowed so much money, in a lump sum, on which to operate the used car purchases, and every salesman also sells used cars. In fact, all departments in this firm are operated on a budget system, with a fixed allotment for each.

Butler has a habit of sending up to the shop for a rebuilt car, at least once a week, and putting it through the hardest day's driving any car ever gets.

This habit of taking any rebuilt car out for a test run at least once a week, according to Butler, does four things: First, it establishes confidence in his used cars, in his own mind; second, it puts confidence in the Butler-Veitch used cars in the public mind, for the newspapers tell of this stunt every time he does it; third, it assures the men selling used-cars that their rebuilt product is exactly what it is claimed to be; fourth, it keeps the repair shop up and going, for no one except Butler knows which car he is going to select for the test.

On each new car which goes out from the Butler-Veitch

salesrooms, is bolted a bronze plate, bearing the following statement:

"We agree to completely rebuild this Marmon High Efficiency Motor whenever it may become necessary from normal use and wear—barring accident or abuse—for a total cost of \$295. This cost will vary only with the cost of labor and materials, and is based on costs as of February 1st, 1922. This rebuild includes complete replacement, where needed, of all parts liable to wear."

"When rebuilt, this motor is warranted in accord with the terms of the Standard Warranty of the National Automobile Chamber of Commerce.

"The advanced design and simplified construction of the Marmon High Efficiency Motor makes this agreement a practical business proposition.

BUTLER-VEITCH, Inc.,

Distributors for Northern California.

No.....

At the end of this test-period, for the flat rate system, Butler-Veitch is so fully converted to the plan that it will sell supplies only to those dealers and those repair shops which

maintain standardized service, and is trying, by every means in its power, to persuade every dealer and every repair man in northern California to put himself on a flat-rate repair basis.

How Reflectors Work

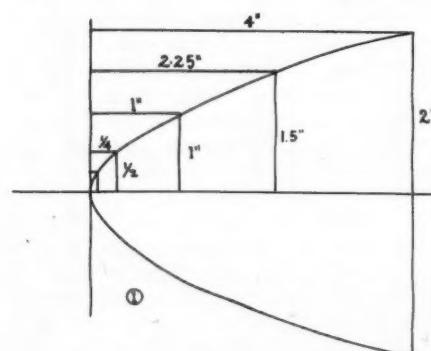
If you were working for an automobile manufacturer and had charge of the electrical testing;—And if you happened to turn on the head lamps of one car and saw the lamps of another car brighten up at the same instant;—And if you were perfectly sober and tried

and that I might have some fun with them, so I called them around to see the mystery and had them hunting quite a while for concealed wires that might be connecting one car with the other.

After I had had my fun out of the experiment, I started to dig into the action of reflectors, and found how the parabolic reflector is shaped, for it is quite different from a spherical surface. In Fig. 1 is illustrated the method to use in making the curve that is the basis of head lamp reflectors.

First make two lines crossing each other at right angles and from the point where they cross measure up any distance, say one inch. Then measure to the right an inch and make a point on the paper. Now measure up one and one-half inches and to the right—the square of this distance. In this case it is two and one-quarter inches. In the same way we measure up two inches and to the right four inches, each measurement to the right being the square of the corresponding vertical distance, and that's all there is to it.

Now, in Fig. 2, we come to the interesting part, where we have rays of light coming to the reflector, and when parallel to the axis of the reflector as shown,



New Six-Cylinder Mercer Added to Line

Car Has General Characteristics of Former Models, Frame Made Stiffer and Car Has New Three-quarter Floating Axle

MERCER has added a new six-cylinder to its line of four-cylinder cars. This has been done chiefly to get a wide range of speed on high gear and a car that handles well on high gear in traffic.

The chassis of the six is not entirely new, but most of its major units are either new or have undergone more or less change. Certain features which have been characteristic of Mercer cars, such, for example, as the propeller shaft service brake, are retained. Other unconventional parts, such as the four-speed gearset, are no longer required with an engine of six cylinders, while the use of a unit powerplant has made it desirable to employ three instead of four-point mounting.

Outside the powerplant, the chief change is the substitution of a new rear axle and the use of additional and stiffer transverse frame members made necessary by the change in engine mounting. The steering gear and front axle as well as the radiator are practically the same as those used in the four-cylinder model. The mounting of the last mentioned unit is on spherical trunnions, as before, but the spherical surfaces are now kept in contact by an enclosed helical spring.

The wheelbase of both the four and the six is 132 in.

The new engine is of the overhead valve type, with the cylinders cast in block. The cylinder head casting is flat on its under surface, consequently the combustion chamber has a true cylindrical form and all its surfaces are ma-

chined all over. The head is attached to the cylinder block by nickel steel studs which are less apt to stretch than studs of soft steel. The compression ratio is 4.7 to 1.

The valves are vertical and seat directly in the head. The inlet and exhaust valves are identical and both are made of tungsten steel. The clear opening is 1 9/16 in.

The main bearing caps are of aluminum, with drop forged steel reinforcements. These bearings are bronze backed, babbitt lined and measure 2 1/4 in. in diameter. The camshaft bearings are die cast babbitt and are pressed into the crankcase. The gear type oil pump is driven by a vertical shaft, its driving gear meshing directly with another gear forged integrally with the camshaft. Helicott cut-out timing gears are used.

The centrifugal water pump is provided with a stainless steel shaft to insure freedom from corrosion. The lighting generator is driven off the rear end of the pump shaft while the rear end of the generator shaft is used to drive the Eisemann magneto.

The Lynite pistons are constant clearance type, and provided with three rings above the pin. No scraper ring is employed. The piston pin is of hollow tapered section and is fastened in the rod.

Connecting rods are drop forged, high carbon steel of H-section and measure 10 in. center to center. The bronze back, babbitt lined, big end bearing measures 2 1/2 in. in diameter by 2 1/2 in. long. The

rods are machined on the outside edges and the web is drilled to reduce weight. Two nickel steel bolts are used to secure the big end bearing.

The crankshaft has crescent shape throws, oil being fed through the shaft and around these throws by external pipes placed circumferentially in order that centrifugal force may not interfere with the flow of oil through the pipes, about 40 lbs. per sq. in., as the speed increases.

The engine has 3 1/4 in. bore and 5 in. stroke giving a piston displacement of 331.3 cu. in. It develops its maximum of 82 to 84 horsepower at about 2600 r.p.m.

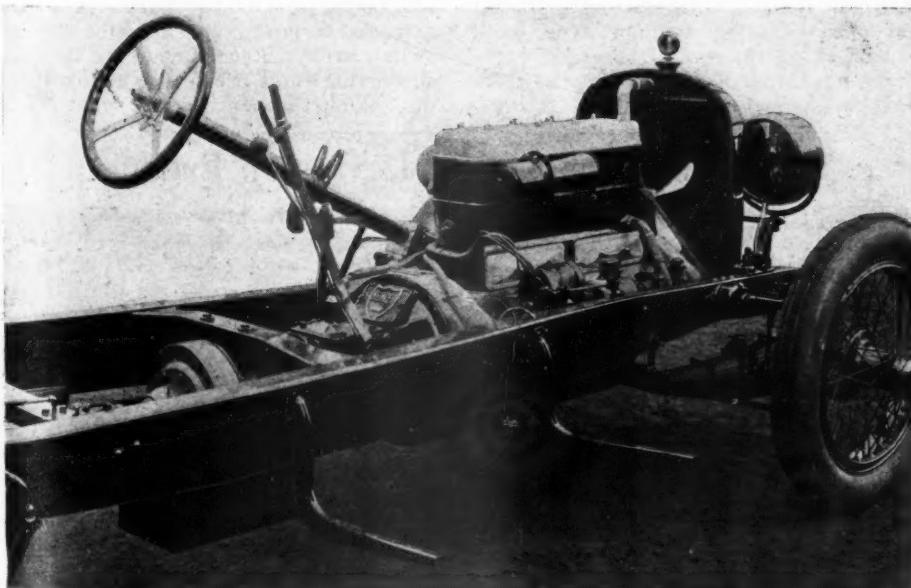
The front end of the engine is mounted in a spherical trunnion which is concentric with the crankshaft while the two rear supporting arms of the engine are bolted solidly to the frame. In this case, as with other parts bolted to the frame, rather thick shims are employed to give the desired alignment. This makes it possible to interchange engines in the same chassis without changing the drilling, and still assure correct alignment.

The drive is the Hotchkiss type, the springs taking torque as well as pushing the car. This arrangement has long been used on Mercer and has proven highly satisfactory.

The new rear axle is a three-quarter floating type. It is provided with a one-piece pressed steel housing which has a single welded joint. The spiral bevel gears give a reduction of 4.08 to 1 in case of closed car axles and 3.77 to 1 in chassis fitted with open bodies. The ring gear is provided with serrations which fit the splined differential housing and take torsional strains, so that the rivets serve only to hold the two parts together. All bearings in the rear axle are of the taper roller types. The hand operated internal expanding brakes on the rear axle are carried in flanged drums of 16 in. diameter and are completely enclosed.

The use of a unit power plant with three point support has necessitated some changes in the frame as compared to that employed in the four. The side rails are practically unaltered, but there is a new and rigid cross member to support the front end of the engine and a wider and stiffer rear cross member above the gasoline tank. The central cross member is provided with wider flanges than were formerly used. The tubular cross members, one of which was in front of the radiator, and one near the rear of the frame are now eliminated. The battery carrier is attached to the right side member of the frame, under

(Continued on next page)



The new Mercer six-cylinder engine, the mounting of which has made necessary additional and stiffer cross members in the frame. As on former models magneto ignition is retained

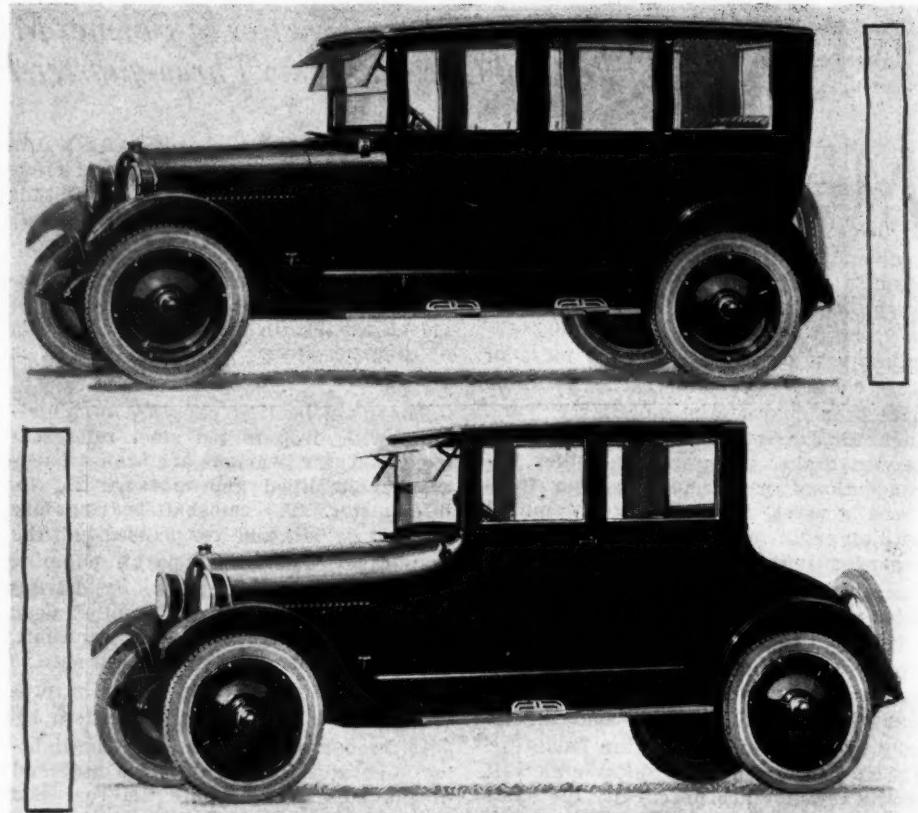
Reo Adds Two New Enclosed Bodies of Steel

TWO new bodies, a sedan and coupe, have been added to the Reo line. These sell for \$1885 and \$1835 respectively. These models have steel bodies and will be produced along with the aluminum bodies which have been in production for some time and at a higher price. The standard T6 chassis is used for both with the exception at 32 by 4 in. tires are fitted to steel disk wheels.

The body in the sedan is proportioned to seat five passengers. Measured inside, the upholstering the measurements are, front seat, 43 in. wide by 19 in. deep; rear seat, 47 in. wide by 19 in. deep. There is a pocket in the left rear quarter and a shallow tray under the rear seat. All doors have double catches, eliminating accidental opening if they are not fully closed. The side windows are controlled by hand straps. All window mouldings are walnut. The interior is upholstered in heavy woolen cloth in a dust proof brown shade with light blue stripe. The trimmings are in gray satin finish.

The chassis and fenders are finished in black enamel with two finishes optional for body as follows: Body and hood in flat Crane Simplex surface, light gray below the belt and slightly darker gray above, or regular high gloss varnish finish in Brewster green under body and black above belt.

The appointments of the coupe are much the same as in the sedan and it is in the seating arrangement where the two differ. In the coupe regular seating capacity for three is supplemented by a comfortable auxiliary seat. This seat has a left arm rest, the right one having been omitted so the passenger can read-



ily enter or leave. When not in use this auxiliary folds completely out of the way thereby giving additional floor space. The passengers' seat has a maximum width of 37 in. and is 23 in. deep. The driver's seat is 17 in. wide and 20 1/4 in. deep. The auxiliary seat is 14 in. wide and the same dimension deep. Arranged to provide armchair comfort. Behind the driver's seat is a spacious package com-

partment measuring 12 in. wide, 21 in. long and 21 1/4 in. high. This compartment is of the built-in design and is further concealed by a hinged cover. The framework selected hardwood. All joints are filled, glued and screwed or bolted. The outer covering is of steel, the panels having open joints, this being accepted as the best practice to prevent cracking and breaking of the finish.

(Continued from preceding page)

the front seat, while the muffler and exhaust pipe are now on the left side.

The appearance of the front end of the car has been slightly altered by removing the tubular frame member in front of the radiator and changing the shape of the splash pan. The front horns of the frame are now provided with fore and aft bolt holes for bumper mounting, and carry a new design of lamp bracket. This is triangular in side elevation and has at its upper end a socket in which forked lamp supports of various sizes can be attached.

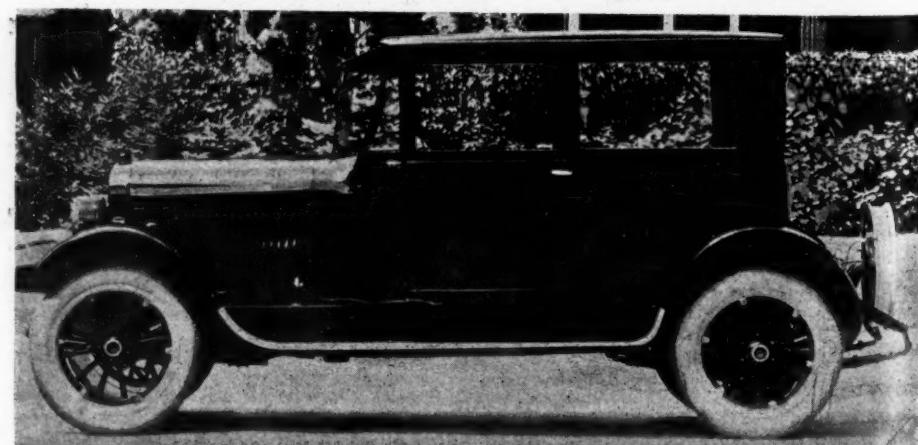
Six standard body models are offered. The open models include a four-passenger roadster, six-passenger phaeton and four-passenger sport model. The closed bodies include a sedan and a touring limousine, each seating six, and a four-passenger coupe. Body lines are similar to those which have characterized the Mercer cars in the past.

The open models will sell at \$3,750 and closed cars for \$5,000. These prices include, among other items, the following equipment: 32x4 1/2 in. cord tires and

five (5) Rudge Whitworth wire wheels on open models; artillery type wood wheels, 33x5 in. cord tires and 2 extra rims on closed models, Waltham clock and speedometer, Motometer, Alemite

lubricating system on chassis parts and a special form of finger operated dimmer switch arranged just under the steering wheel rim where it can be operated without taking the hand off the wheel.

Royal Coach, a New Lexington Product



This is the Lexington Royal Coach, a five-passenger closed model just added to the line. There is a wide deep seat in the rear for three and two Pullman-like chairs in front.

Paris Show Reveals Trend Towards Smaller and Faster Engines

Overhead Camshaft Popular. Lancia Exhibits Frameless Car

PARIS, France, Oct. 6—With 1,050 stand holders the Seventeenth Paris Automobile Show was opened yesterday by Minister of Commerce Dior in the Grande Palais here. This is the largest automobile show that has ever been held in France. It has been necessary to erect temporary buildings with a floor space of 140,000 sq. ft. in order to take care of all those desiring space.

The salon is representative of the entire continental automobile industry, but there are only three British firms represented, while the American exhibitors are but six in number. American firms are working at a great disadvantage in seeking business because of the exchange situation and the high import duty on American automotive products. Ford, with a stronger position in the French market than any other American firm, has not thought it worth while to apply for space in the shows.

A slight tendency toward increased prices is in evidence although practically no price changes of importance have been announced. The trend toward slightly higher prices is due to a combination of three factors.

- 1—Increased raw materials costs.
- 2—Slightly increased labor rates.
- 3—Lack of foreign competition with the exception of Italian.

The most pronounced tendencies of the Paris show this year are the decrease in engine size and high rotative speeds of engines, made possible by lighter reciprocating parts, including in particular, the extensive use of aluminum pistons.

There is a great increase in the number of overhead valve engines being used in sport cars. The progress made by battery ignition last year has been arrested, magneto ignition having recovered some lost ground.

Four-cylinder engines dominate the show. The Fiat is the only twelve-cylinder model exhibited. There are no new eight-cylinder jobs shown and there is very little production on the eights already in existence. Some gains have been made by the six-cylinder engines but they have been of little importance and have been confined to engines in which the piston displacement is 122 cu. in., or less.

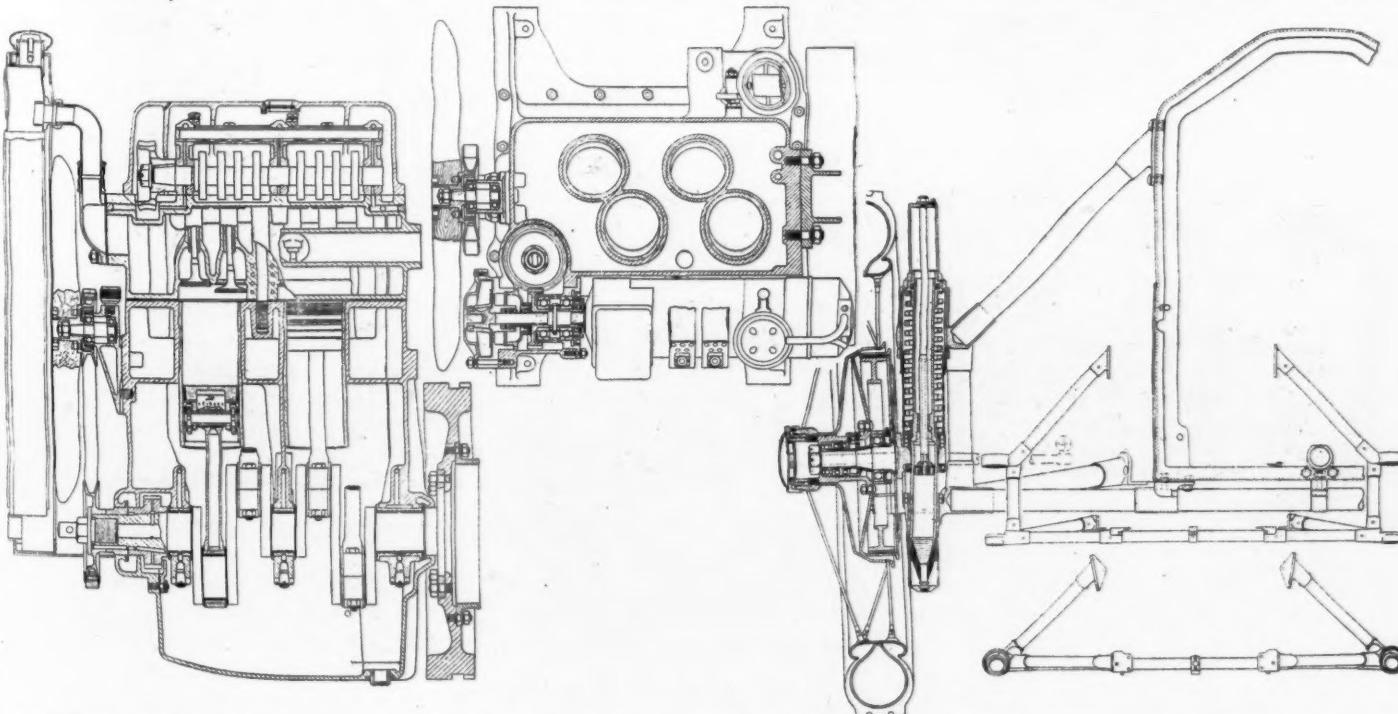
Four-wheel brakes are being used far more extensively than ever before. The Perrot system alone is used on thirty-five makes. They are found on small cars with a piston displacement as low as 91 cu. in. In addition to the large number of firms now using four-wheel brakes as standard equipment, many others announce them as optional equipment. When front brakes are fitted they

are usually operated by the foot. Hand brakes, operating on the propeller shaft, are still used but in many cases have been abandoned altogether. There is some tendency to do away with rear wheel brakes. This practice is the result of racing experience and has been followed by Chenard, Walcker and Bignan. These firms have Hallot type servo transmission brake and a pair of brakes on the front wheels.

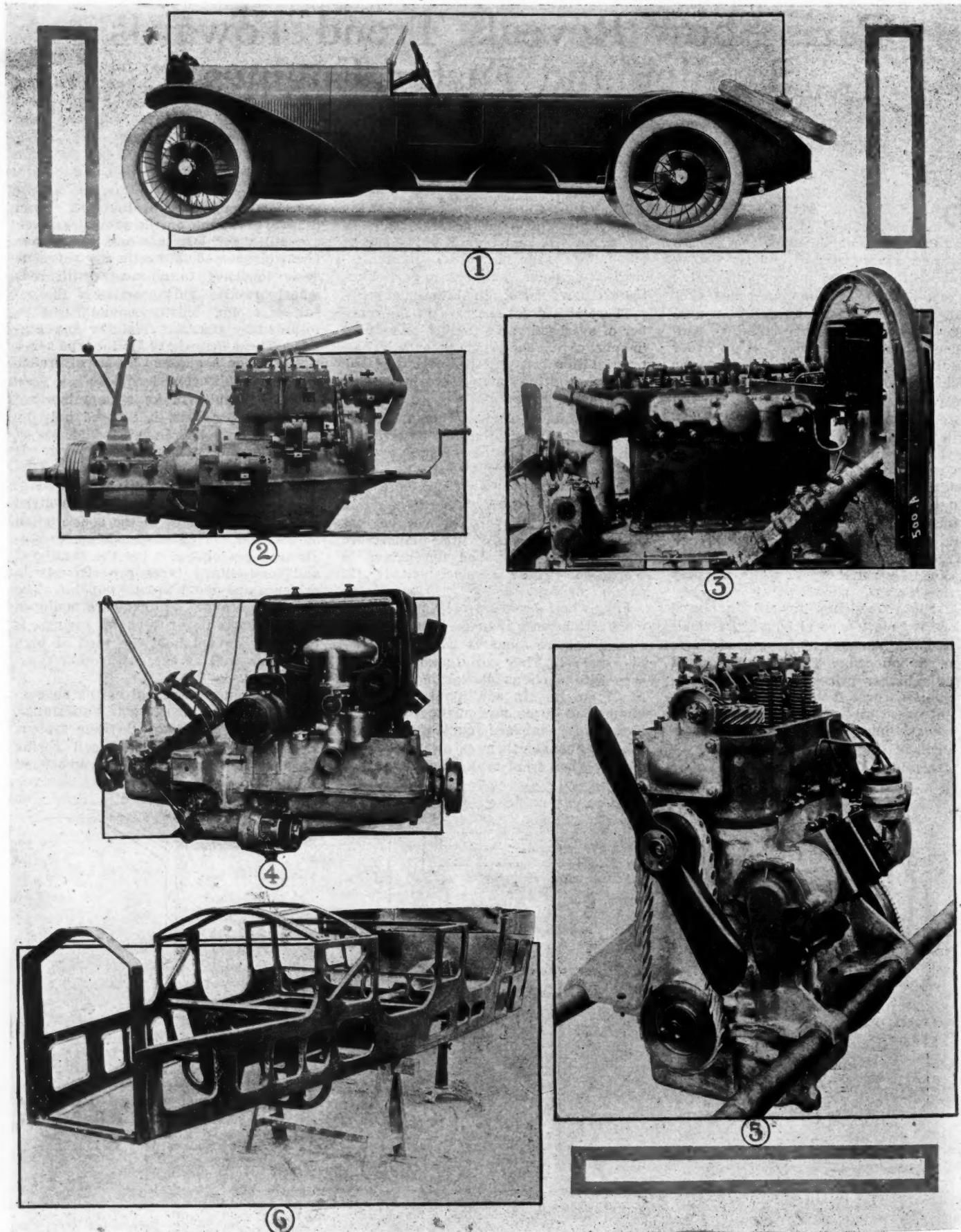
The hydraulic brake system has not made any progress, it is used only by Rolland-Pilain and Bugatti. The use of the servo mechanism is increasing. It is now being employed by Ballot, Hispano Suiça, Fiat, Renault and others.

Considerable attention has been given this year to changes in the construction of the rear spring suspension. No single type predominates but the cantilever and semi-elliptic types are strongly in evidence and about equally popular. The objection brought against cars equipped with the cantilever type of springs is that they do not hold the road at high speeds as well as cars with other types of springs.

Several unconventional spring suspension types have made their appearance, one of these being the De Ram system, a combined hydraulic and coil spring used on the Bignan. This is somewhat



Probably one of the most interesting things at the Paris show this year was the Lancia, the frameless car fitted with a four cylinder engine in which the cylinders are placed as shown in the sectional drawings. This makes for a short engine and eliminates a forked connecting rod and two rods working from one crank pin. The front wheel and spring mounting is shown at the right



Some Exhibits at the Paris Show

1—The Lancia, the frameless car with a weight of only 1690 lbs. and a road speed of 75 m.p.h. 2—Powerplant of the Unic. 3-4—Two French engines, showing compactness and arrangement of accessories. 5—The engine of the Lancia. Note the airplane type fan and gear drive for overhead camshaft. 6—The frame and body structure of the Lancia.

similar to the type of front springs on the Lancia frameless chassis. The practice of building shock absorbers as an integral part of the chassis is becoming more pronounced.

Poppet valve engines dominate the field although Panhard has continued its sleeve valve engine and has dropped all poppet valve models. Mors, Minerva and Voisin also continue to use sleeve valve engines. Peugeot has added one sleeve valve type and is also preparing to market the special two-stroke cycle, semi-Diesel type engine for passenger car work.

Bignan has placed on the market this year a valve gear which positively opens and closes the valves. This design was used with much success last season in racing car of the same make.

The great demand for economy in operation has been responsible for considerable work in connection with high speed engines of the overhead valve type with small piston displacement. Speeds of 3,000 r.p.m. for normal type engines are quite common.

Sixty-seven per cent of all the cars made by continental manufacturers are fitted with aluminum pistons. Bignan and Voisin announce the use of magnesium pistons on their sporting type engines. In developing valve-in-head engines continental designers have favored the location of the camshaft in the crankcase. This construction appears in a majority of cases. The overhead type of camshaft generally is used on the more expensive cars although there are some exceptions. Fiat, for instance, has produced a high grade six-cylinder valve-in-head engine with the camshaft in the crankcase. In this case the timing gear chain is located in the rear and all engine accessories, including the carburetor, are carried between the crankcase supports and are hidden by detachable covers.

DeDion-Bouton has adopted overhead valves for both its 12 and 10 hp. models. Both of these jobs are fitted with Perrot front wheel brakes. Delaunay-Belleville is showing a new type 3.15 in. by 5.91 in. overhead valve engine with overhead camshaft and detachable head. This

model is also fitted with Perrot front brakes.

Hotchkiss has a small four-cylinder model with an L-head engine of 3.15 in. bore and 4.72 in. stroke. A return has been made to the Hotchkiss drive on this new chassis. This is a medium sized car capable of making 65 m.p.h. It is now equipped with Hotchkiss type front brakes which were formerly used only on the Hotchkiss big six.

Small two and three seated models with a 96 in. wheelbase have been added to the Renault line. This new chassis is equipped with a four-cylinder engine of 1.97 in. bore and 3.54 in. stroke. This car is in the same general class as the one produced by Citroen about a year ago and will come into direct competition with the Citroen model. Its mechanical features are similar to those of the four passenger 10 hp. Renault which is being made on a big production basis. The only essential difference is in the use of a detachable head.

Renault has adopted diagonal cantilever springs on all cars above 10 hp. The radiator, formerly back of the engine, is now placed in such a position as to form a continuation of the hood on each side of the car, thus changing completely the external appearance. The Citroen line remains unchanged except for details but a sport model has been added. This is fitted with aluminum pistons and the other reciprocating parts are also made lighter in order to realize an engine speed of 3,000 r.p.m.

Ballot is now ready to market a 122 cu. in. touring model. The engine of this car is an overhead valve type. Four wheel brakes are standard equipment. This car is said to be capable of making 65 m.p.h. when carrying a four-passenger body and is reported to run 20 miles per gal. of gasoline.

Mathis has produced two small sixes, one with overhead valves, the other with side valves. The bore and stroke of the overhead valve model are 2.26 in. and 2.65 in. respectively while the side valve model is 2.16 in. by 3.15 in. These are the smallest sixes in the show. Because of their small size they are fitted with the new Bosch 12 m.m. spark plugs. The Mathis engineers declare that this size

plug is just as satisfactory as the larger sizes and express the opinion that it will eventually displace the large models.

Mathis is using, on the small sixes, a rear axle made of aluminum silicon alloy. Another example of the use of cast aluminum alloy housing with steel tube liner is that employed on the Bignan cars. Rear axle construction, in general, however, is tending towards the pressed steel welded type with spiral bevel gears. All other types of final drive for passenger cars are going out of existence.

The Salmson Aviation Co. has come into the market with a light four passenger car carrying a 70 cu. in. overhead valve engine with overhead camshaft. This new model is practically identical with the type used for racing purposes during the last two years.

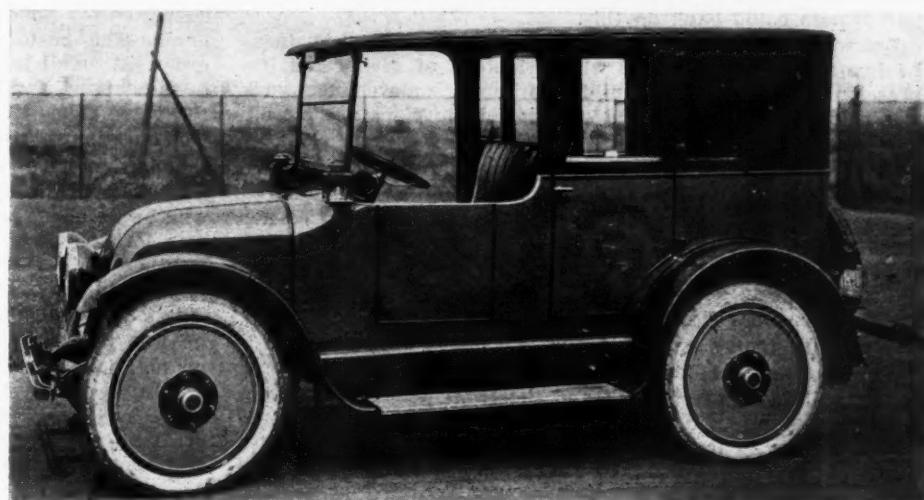
Only a few firms have abandoned American makes of battery ignition but at the same time some European battery and generator systems have come to the front. Talbot-Darracq, one of the first companies to use battery ignition on its popular 10 hp. model, has abandoned this system in favor of the magneto. There is considerable use of the new Scintilla generator and magneto combined in one unit.

There is an important display of small two seated cars in the overflow buildings. These cars carry engines not exceeding 67 cu. in. Practically all of them are four cylinder water cooled jobs with the exception of the four cylinder Sara which is air cooled. A number of big manufacturers are much interested in this diminutive car.

Coincident with the opening of the show came the announcement of a new Rolls-Royce 20 hp. six cylinder model with an engine of 2.99 in. bore and 4.53 in. stroke. The chassis is not on exhibit but it is stated that the engine will be a valve-in-head type with detachable head and with camshaft in the crankcase. Engine and gearset are to be joined to form a unit powerplant. Battery ignition will be employed. Semi-elliptic springs will be used both in front and in rear. This marks a distinct change from former Rolls-Royce practice in which cantilever springs were used on the rear.

Rauch & Lang Electric Taxicab

A fleet of electric taxicabs similar to this one is being put in operation in New York City. Under ordinary driving conditions, it is said that the cab will make 69 miles on one charge. The battery is easily removable and it is intended that two batteries will be used with each cab, one battery being charged while the other is in service. The upholstery is gray leather with dull finish aluminum trimmings. The wheelbase is 102 in., the tires 32 by 4½ in. and the weight about 3700 lbs.



Even the Best Technical Knowledge Must Be Merchandised

An Automobile Expert and Working Hard, Yet Barely Making a Living, Because He Did Not Sell His Service

By B. M. IKERT

NOT long ago a representative of MOTOR AGE happened to be in a certain city of about 40,000 people, from which, he recalled a garage owner had some months previously, written to this publication. In the letter the garageman stated that he was not making money and asked if we could offer some suggestions as to how he might better his business.

It seemed this man had had some experience in the manufacturing end of the automobile industry. He knew factory methods. He was well educated. The tone of his letter showed him to be above the usual type of man operating a garage. You could well imagine him not chewing tobacco, or using cuss words. His letter was frank and to the point.

He was working hard, yet making only a bare living. His place was big, he said. He took in enough money on storage to pay his rent and one or two other items but, after all was said and done, at the end of the month he was not making as much money as he could by getting a good job in some other branch of the industry. Should he stick to the business or give it up? That was the question.

Now, there may be a hundred or more men in just the same boat right now, wondering whether they should go on just about breaking even, or quit. For those we want to present the experience of the representative of MOTOR AGE visiting the garageman who wrote this letter.

In order that the stage might not be set for him, the MOTOR AGE man made up his mind to pass himself off as a car owner who sought the garage for certain repair work.

From the letter this garageman had written MOTOR AGE, it was evident that he had intended his place to be one of specialized service by experts, men who had had experience in the building of automobiles and all that. The place was to be a bit above the ordinary shop or garage. He himself would supervise all work. The maintenance and repair work to be sold was to be of a different caliber from that of other shops. Car owners could bank on this.

But when the MOTOR AGE man came to this place of business he immediately saw things which, instead of giving the impression that here was a building wherein maintenance work was sold on a high grade basis, stamped the place as "merely another garage." A look up and down a few streets close by showed the same thing—garage, garage, garage. This man's place may be called the Union Garage, up a few hundred feet on the same street was John's Garage, around the corner The Elite Garage, and so on.

The MOTOR AGE man stopped across the street from the Union Garage to get an outside impression before driving his car in for the repairs, which were, by the way, simply a "putup job" to get a line on the manner in which the business was being conducted.

The building was of brick and the front had at some time been painted gray. It was a two-story affair and had the name Union Garage in large black letters painted across its entire front. But that was not all. There were more signs. At one

time this man had sold a certain make of tire and the tire company salesman had been given permission to paint, in a blue and white color scheme, a large sign on the face of the building between the entrance and one of the windows.

Other signs included one advertising a spark plug and another a certain brand of lubricant. As the signs were executed in different color schemes they naturally looked more or less riotous. There was no visible thing on the outside of this building to indicate that any unusual class of service was to be had on the inside. The passing motorist would hardly give it a second look. The place did not warrant it. Its place had, in a word, merely the atmosphere of the usual "garage."

The building was not located on one of the main streets. It was on a street that got most of the traffic, however, because motorists wanted to avoid the main street. It was in about the center of the city and its rear entrance faced on a street that carried much truck traffic. So, it had an advantage in location.

Having satisfied himself that there was little if any difference in the exterior of this place, as compared with most garages, the MOTOR AGE man drove inside.

He hardly expected to be met in the entrance by a service salesman and in this he was not disappointed. The only man in sight was a mechanic, working at some job in the far end of the building. This man slowly sauntered over and said "Good morning." From the way the mechanic said "Good morning," and from his actions it was evident he was in no great hurry. He approached as if to gossip. And gossip it was. Just about a full hour of it.

The "customer," as we shall now designate the MOTOR AGE representative, drew his man into a conversation and when finally the customer left his car, to be repaired, in the hands of the mechanic, just an hour of good time had been lost to that establishment. Who could that hour be legitimately charged to? Nobody. It was a dead loss. An unproductive hour. The customer had made known his wants in short order. A small bracket was to be made to hold down one end of the battery, the battery was to be filled, plugs inspected and the valve stems limbered up.

A question or two brought the statement from the mechanic that business was not so good. It had been better, but everybody was a little slack now. And so long as it was that way, why hurry about any job in the garage, was the attitude. There was lots of time and so why not talk about cars, engines, weather and the world's series? And so they did, this customer and the mechanic.

When the customer finally left, he had no idea as to what he was going to pay for the job. The mechanic had made no notations. The customer wondered to whom this hour of gossip was going to be charged.

The customer went out. He wondered about other customers who might come into this place. Would they make the necessary allowances he had made. Might they not think



of this place as being operated by "gyps," wondering how much they were going to "rob" him for the job.

Passing out of the building, the customer noticed a dozen or so signs of various sizes and colors tacked in almost every conceivable way on a wall which partitioned the office and accessory department. The second you came into the building your eye hit these signs but later questioning of the proprietor showed that not a single sale had ever been made on the strength of them, so far as his place of business was concerned.

A small part of the building was fitted up as a salesroom, but this was rented out to a man reported to be a good salesman. The rental naturally cut down the total rent the proprietor had to pay for the building. Later investigation showed that he also saved on his rent by renting out part of the upper floor to a top concern.

No particular time had been set for the completion of the repairs to be effected on the customer's car, but he came back in the early part of the afternoon to talk with the owner of the business. Certain things were apparent on the face of things, but to get the real reasons behind several things only questioning of the proprietor would do.

The proprietor was in the office when the customer arrived. He was dressed in about the same manner as the average garage man. He could get under a car if necessary without it showing too severely on his clothes. He was polite, an intelligent talker and visibly anxious to treat his customers well.

He had formerly held a good job in one of the large motor car factories. He was well versed in design, engineering and production in the automotive industry. Mechanically there was little he did not know regarding automotive vehicles.

But he had always been in a job where he did not have to meet the public. He had had many men under him. They did the detail work and he confined his efforts to the broader activities of the designing department. The MOTOR AGE man knew this, consequently it was a rather difficult thing for him to believe his eyes when he saw this garageman out at the curb selling gasoline to a customer—a job a 10-year old boy could have performed equally well.

The garagemen excused himself several times in order to attend to the wants of other people who came into the building for various purposes. During these times the MOTOR AGE man was able to make many observations about the place.

It was evident for one thing that the place lacked volume of work. The proprietor and one man constituted the entire personnel. One or the other was always on the ground floor to meet customers. At one time the business had done fairly well, but lately was only about holding its own, with the owner making about one-fifth as much money as he had been used to in the employ of the factory, previously mentioned.

The engineering instinct of this man was evident from the excellent manner in which he had charted his business. He had made a curve showing the trend of the business, since its inception a few years ago. He showed how the business had peaked at one time and then began to fall off, the curve remaining substantially flat over a period of several months. He knew where he stood at all times. His books were up to the minute and from this angle little criticism could be made.

Further questioning showed that at one time he had sold cars. Like many other dealers he had been stuck with a lot of cars when the drop came. He lost money on them. Yet there were about 100 cars in the city of the make he had sold. Did he get any of the maintenance work on these cars? Not a bit. They had gotten away from him somehow. Many of his friends drove these cars, knew he was in business, but did they come near his place? They did not.

He was sure, when he started in business, that his friends would flock to his place. He belongs to several clubs in the city and all that. His friends say they'll bring their cars around, but they fail to show up.

He has used the newspapers for advertising more than any other man in the automobile business in that city. The business he has done as a result is nowhere near commensurate with the amount of advertising. He has studied conditions. For instance, he finds many mechanics who formerly worked in factories going from house to house asking car owners for any repair jobs that may be needed on their cars. These mechanics carry tool kits with them and many car owners find it convenient to let these men work on their cars. There is no doubt but what this garageman is justified in saying that these traveling mechanics are hurting the business.

But instead of bewailing the fact that these men are getting some of the business, it would be better to take a hint from them. They are going out after business. That is exactly what this garageman and many others in the same boat, must do. Those friends who said they would bring in their cars must be called on. They must be sold on letting Roberts—as we will call this man—do the work at his place of business.

Roberts says many of them drive past, but never stop. They probably say "That fellow Roberts is making lots of money in his business." No wonder they say it. If Roberts has never let them know that he wants their business, they will continue to drive past without stopping. Roberts don't need their money. He is handling all the work he can do. That's what they think.

Roberts is not a salesman. He is not at home dealing with all classes of customers. A "hard boiled" customer rides him. What the Union Garage needs just now is a service salesman; a man who can drum up business and keep selling maintenance and repairs. A town of 40,000 is too large for a place like





the Union Garage to be looking for work. There are too many orphan cars in the city and surroundings.

There are some small dealers who probably could be induced to let the Union Garage handle their maintenance and repair work. There are hundreds of trucks, fleets of them. A fleet of busses operates between this city and a neighboring city. Potentially there is a large volume of maintenance work to be had.

Another point. The man to whom Roberts rents his salesroom has just taken the agency for a popular car. Nothing definite has as yet been done by this salesman regarding the maintenance question on the cars he is sure to sell. Who could be in a better position to handle the maintenance work on these cars than Roberts? At least, so far as proximity to the salesman is concerned?

That is one of the first things we would like to see Roberts do, ally himself with this salesman. Let the latter take care of selling the cars and the maintenance too, so far as that's concerned. Then Roberts can take steps to put his place on such a basis that sooner or later he will have several men in the shop and he can supervise the work. Certainly a man who has routed work through a factory can route maintenance and repair work through a shop systematically.

Roberts has to go after business. He admits he has never tried it, excepting through newspaper advertising. He says it is hard for him to ask for business. It should not be, especially to get those hundred or so car owners who bought his cars some time ago. The make of cars these people are driving is in the cheap car class. That makes some difference, because the less a car costs, the more you are apt to find its owner trying to make his own repairs. But just the same, there are certain jobs that an owner cannot do as well as the maintenance station.

Therefore, we would suggest that Roberts get together a certain group of operations on this make of car and set a flat price for the groups. He is sold on the flat rate, anyway and has sufficient data with which to establish such operations and prices. He knows the names of every owner of those cars and what could be easier than to send each owner a letter with a small circular telling them of these operations.

He could go a step farther and call each owner by telephone. If he got only twenty of those hundred owners to drive their cars in for one or more of those operations, the cost of the letters and circulars would be offset and there would be money left as clear profit. If the work was well done, every owner would become a booster.

But before Roberts can receive company he must put his house in order. His place does not impress the car owner as being any better fitted to sell maintenance than the average alley garage. Let him begin on the outside of the building. First, let him give the front a new coat of paint; a bright cheery color. Never mind the tire, spark plug or oil signs. Paint right over them. Forget them. They never brought in a cent and probably held away trade because there was nothing different about them from all the other signs that other garages had tacked or painted on them.

Next, let him forget the name Union Garage. What does it mean anyway? Here he is, Roberts, a mechanical engineer and one who ought to be able to sell car owners a highly specialized form of maintenance on their cars, muddling along with a "Union Garage" sign. He should be building around the name Roberts. It's Roberts who is trying to see to it that car owners get the utmost out of their cars. Car owners must be made to say "I took my car to Roberts." Not "I took my car to a garage."

So, we say let him put his name across the front of the building in any way his fancy might dictate. A catch line under the name will help. Let it be most anything but the trite expression "Auto Repairing." That expression means little to the car owner save that it might remind him of the fact that one day he was "robbed" by such a concern.

Now for the inside of Roberts' place. It won't cost a cent to rip off the signs which various salesmen have tacked up around the place and particularly on the wall which flanks the office door. Then there are signs painted on the rafters indicating that storage rates must be paid in advance, that the place is not responsible for fire and similar commonplace statements. These might all be removed.

Let the wall from which the signs have been removed be given a coat of light colored paint, with perhaps a darker shade from the floor to a height of five or six feet. A slate color looks pretty well, with a cream or fawn color above. Now let some good sign painter make one neat sign incorporating all the important items necessary in such an establishment. This sign need be no larger than about $2\frac{1}{2}$ by 3 ft. It can be framed with a black frame and then hung on the newly painted wall at such a height that a person easily can read it.

The minute car owners see this they will get the impression that here at least is a "garage" that wants to be different. Many similar things might be done to give the place a different look. People must be made to feel that this place of business is different.

There is something to say about the mechanic Roberts has working for him. He pays this man \$22 per week. Not a large salary for a mechanic, but maybe that's all he is worth, and maybe, too, \$22 a week work is all Roberts is getting from him. Obviously this man, being the only mechanic in the place, has to be an all around man. He is not. If he were he would be working today as a trouble shooter, service manager or shop foreman. You cannot get an all-around man for \$22 per week. This mechanic does his work well and no doubt there is a place in the shop for him. But it is not logical to assume a man can wash a car and trace ignition trouble equally well.

One man is not enough in a place as large as the Union Garage. It is at the present time, yes, but when Roberts gets those 100 owners lined up and makes some sort of arrangement with the salesman next door to handle the maintenance work on the cars he sells, other arrangements will become imperative.

Probably a good plan is for Roberts himself to become serv-



ice manager. He is an excellent man to handle the shop. A boy can be trained to do some of the smaller jobs, take charge of the stockroom and sell gasoline and oil. Records must be kept, letters written, accessories sold, and for this a girl is the answer. Roberts does all this himself just now. He has too much detail to look after to give time to building a greater volume of work.

Another mechanic and the place would be pretty well rounded out, excepting for a service salesman. The salesman next door might easily act in this capacity, because once he has sold a man a new car it is but a step to sell him the maintenance too. Then after the car owner got to coming to Roberts' place, the latter in the capacity of service manager easily could take care of him. In fact, Roberts' own statement was "I can take care of them all right after I get them in here."

By the time the MOTOR AGE man had gotten pretty well acquainted with Roberts' business it was time to drive his car out. The mechanic had finished the job. Roberts' had evidently enjoyed the visit of the MOTOR AGE man and when the latter asked "How much do I owe you?" Roberts replied. "Nothing, I appreciate your coming in . . ." That was another thing for the MOTOR AGE man to talk about.

Roberts is probably too good to his friends, when they do come to his place of business. He probably does many small jobs and does not charge for them. Suppose the MOTOR AGE man, who in all respects was a customer in this place, was allowed to go out without paying for the work which had been done on his car, as it was the hour which was spent gossiping with the mechanic was not accounted for, the whole affair was a dead loss.

During the time spent at the Roberts garage, the MOTOR AGE man saw a man come in and ask for a certain part. The parts department was upstairs and the customer was told to go help himself since he knew where the parts were kept. The customer probably was trustworthy and all that, but the idea of letting anyone have access to the parts department is fundamentally wrong.

No one but an authorized person should have access to the stock room. Friends are just as likely as not to inadvertently help themselves to parts which later on are never put down on the books. Parts belong under lock and key and the key should be kept by the responsible person.



The Union Garage must tool up more completely if it is going to handle any great volume of maintenance work. Roberts knows this. He has bought some equipment, chiefly a large arbor press and it is one of the best of its kind. Roberts stated he believed in buying the best when he did buy, which of course, is good business when it comes to shop equipment.

The place needs a drill press, engine stand, grinder, electric valve grinder and drill and similar pieces of equipment found in the better operated shops of today. Good equipment can be advertised on the circulars sent out. Car owners, while they like to know that a shop is anxious to sell the best kind of maintenance work, also like to know that such shops are capable of doing it by virtue of good equipment.

Of course, no shop can be expected to tool up elaborately unless it sees a chance ahead to make use of this equipment. Roberts is prepared to spend a little money at the present time to help his business. This money preferably should be spent on making the improvements suggested earlier in this article and towards getting those "friends" to come in with their cars. Roberts must lift himself out of the usual "garage" class. He must let the people of his community know that his place is prepared to sell maintenance on automotive vehicles, on a standard much higher than the average.

23 Years Ago This Week In Motor Age

The National Master Horseshoers' Protective Association met in Pittsburgh Oct. 10 and discussed, among other things, the inroads of the automobile on horse traction. Instead of railing against the automobile and its faults and passing idle resolutions to stop the tide of events, the Horseshoers' Association took the sensible course of deciding to do its share toward removing some of the objections to horses.

The Davises Still Traveling

Mr. and Mrs. John D. Davis have reached Chicago with their ill-fated motor carriage. Little of the original motor and running gear mechanism with which the couple started from New York under the auspices of the New York Herald was left, the principal remainder, it is said, being the rear axle; and that broke at the crossing of 71st street and Bond avenue in Chicago. When the new axle shall have been fitted it is the intention to proceed on the way to San Francisco.

From the Advertising Columns:

For Sale—A second-hand automobile. Price right. Gilbert J. —, Westfield, Mass.

Now He Is a Flivverboob

The chauffeur who "scorches" but fails to show skill is called a "chauffard."

This Was a Big Merger

On Oct. 10 the Continental Automobile Co. was incorporated under the laws of New Jersey, with a capital of \$8,000,000. * * * As a foundation for this capitalization the Continental Automobile Co. has acquired all of the property, patents, manufactured stocks, rights, good will, business contracts and the capital stock and bonded issues of the Winton Motor Carriage Co. of Cleveland, O.; the Manhattan Oil Motor Co. of Jersey City, N. J., and the National Motor Carriage Co. of New York City, delivered free of all liabilities. This deal is the upshot of the negotiations which have been carried on for several months with a view to com-

bining all the gasoline motor manufacturers who control valuable patents under one management.

Autocar Company of Pittsburgh

Among the new concerns which enter upon the manufacture of gasoline motor vehicles under favorable auspices financially and mechanically, the Autocar Company of Pittsburgh takes prominent rank. It succeeds to the stock and book orders of the Pittsburgh Motor Vehicle Co. and is organized to manufacture on a large scale the three types of vehicles which through two years of costly and systematic experimental work have been brought beyond the experimental stage by the latter.

Letting Cars in the Parks

PHILADELPHIA, Oct. 9—After mature deliberation, that extremely conservative body, the Fairmount Park Commission, is beginning to see the light—at this week's meeting it will actually vote to recommend the opening to the use of automobiles certain of the less frequented park roads!

Interesting Electrical Principles Embodied in Remy Tractor Type Generator

Principle of Electro Magnetic Torque Reaction Is Made to Rock the Frame Which Connects With Throttle to Control Speed of Engine

By A. H. PACKER

THE Remy generator, Model 259, for use on tractors, is designed to do two things. First, of course, it supplies the electrical current for charging the battery. Its second function, which is obtained by special construction, is to control the engine speed, or in other words, act as an electrically operated governor.

To thoroughly appreciate the underlying principle on which this design is based we will refer to Fig. 1, which gives the magnetic effect produced by current flowing in a wire. In the upper right sketch in Fig. 1 is shown a section through a wire or conductor, this being represented by a solid black dot, which for our purpose will represent the end view of a wire carrying current away from us, or in toward the paper. Under these circumstances lines of magnetic force are produced clockwise around the wire, as shown by the arrows.

Just at the left of this sketch is shown another wire, cross-hatched two ways, which for our purpose will indicate that current in it is flowing toward us, or out from the paper. This reverse direction for the current reverses the direction of the lines of magnetic action so that they go in this case counter-clockwise around the wire.

Below these two wires we have a north and south magnetic pole, between which are lines of force going from one to the other, as indicated by the arrows, and in between these poles we have three wires.

The upper wire, represented by a circle, has no current flowing in it and accordingly has no magnetic effect. The lines of force from the north pole to the south pole are therefore not interfered with and pass from one pole to the other as though the wire were not there. The wire B, however, with current flowing in toward the paper, has a tendency to produce lines of force around it as shown in the upper right-hand sketch. The north and south poles, however, are trying to send lines of force from right to left.

Distortion of Field by Wire Carrying a Current

The result of the combined action of the wire carrying a current and the magnetic field is that on the under side of the wire the direction of magnetic action of the two causes is in the same direction, so that the strength of the magnetic field under the wire is increased. On top of the wire, however, the direction of the force produced by the wire opposes or neutralizes that of the magnets, so that the field above the wire is weakened.

This produces the resultant distorted magnetic field, where with the middle wire the lines of force are pushed out of their normal path and go under the wire. Conversely, at the lower wire, where the current is in the reverse direction, the lines of force crowd together on top of the wire.

In the theory of magnetism where we make use of the idea of lines of force, we consider that they have properties like rubber bands and always tend to shorten. This being the case, there is obviously a tendency for the lines of force to push the middle wire upward and the lower wire downward, and this is the action that makes an electric motor run, this force or side thrust being present wherever a wire running across a magnetic field is allowed to carry an electrical current.

We will now consider the action that takes place in an electrical machine that is capable of operating either as a generator or motor. In Fig. 2 we have such a machine represented diagrammatically, there being a north and south pole

CURRENT FLOWING OUT PRODUCES COUNTER CLOCKWISE MAGNETIC LINES AROUND WIRE

CURRENT FLOWING IN PRODUCES CLOCKWISE MAGNETIC LINES AROUND WIRE.

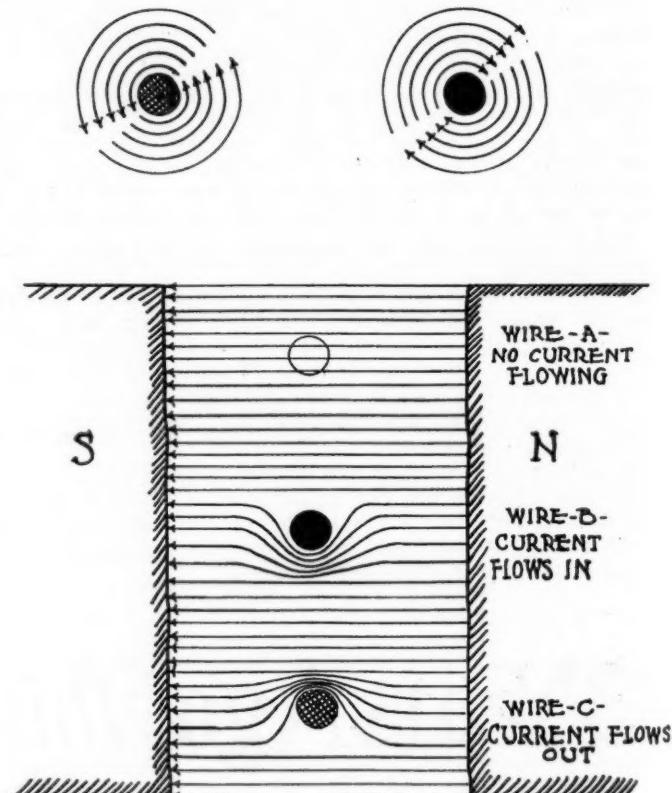


FIG 1
EFFECT OF A WIRE CARRYING A CURRENT IN DISTORTING A MAGNETIC FIELD.

to give the magnetic field, and an armature having wires or conductors in which the current flows when operating either as a motor or generator.

In Fig. 2, however, we will assume that the field poles are magnetized or excited from some outside source and that the machine is being driven so as to generate electrical voltage. We will further assume that no load is connected, so that while the armature wires are generating electrical voltage or pressure, that there is no actual flow or current in them. Under these circumstances there will be no magnetic effect due to the wires and hence no distortion of the magnetic field. There is then no thrust on the wires in either direction and nothing to produce or hinder rotation of the armature.

The next case to consider will be Fig. 3, where we assume that the machine is connected to a source of current such as a storage battery, and is therefore operating as a motor. Under these circumstances current in the armature wires will be flowing in toward the paper in the wires under the south pole and out from the paper in the wires under the north pole,

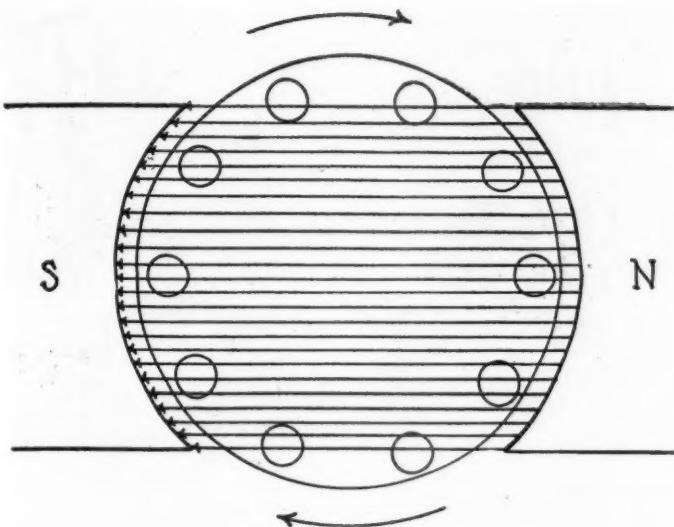


FIG. 2

GENERATOR FIELD NOT DISTORTED WHEN ARMATURE CONDUCTORS CARRY NO CURRENT

the rotation being clockwise. The small arrows around each armature wire show the direction of the magnetic action produced, and the field distortion will then be as shown.

Now if we assume that the lines of force try to straighten out like rubber bands, there will be a downward force exerted on the wires at the right and an upward thrust on the wires at the left, all of which will act to produce the clockwise rotation, which we have considered to be correct.

Torque Reaction

While we are considering that the field frame of the motor is being held stationary and the straightening tendency of the lines of force will rotate the armature, it is equally true that if the armature should be held, there would be an equal tendency for the field frame to rotate in the opposite direction.

The fact that action in one direction is accompanied by reaction in the opposite direction is illustrated by the act of jumping into or out of a row boat. In jumping in, the reaction is against the dock, which, being comparatively well secured, is perhaps not noticed. When jumping out of a small boat, however, care must be used, as the reaction often shoves the boat away instead of permitting the person in question to reach

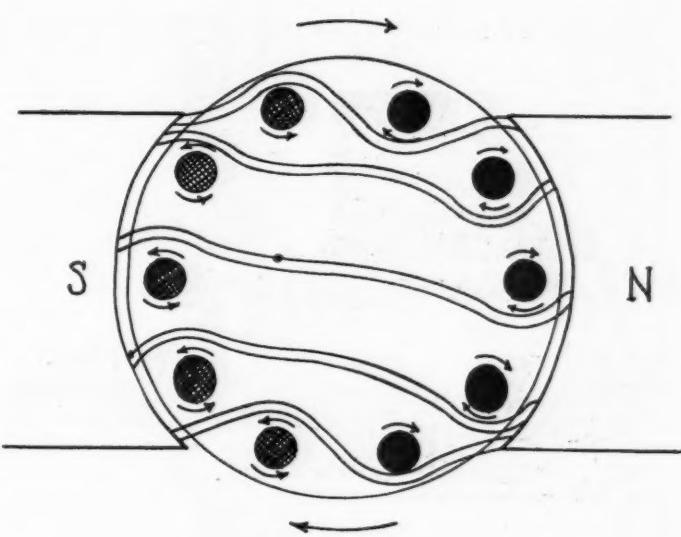


FIG. 4

DISTORTION OF MAGNETIC LINES OF FORCE WHEN MACHINE OPERATES AS A GENERATOR

a firm footing. At summer resorts this often produces ludicrous accidents where so-called land lubbers unfamiliar with the ways of water craft will sometimes fall in, not figuring on this mechanical principle, which widens the water space by the very effort that was intended to bring the person in question to the shore.

Referring now to Fig. 4, we have the same machine used as a generator, the field poles and rotation being the same but the direction of current in the armature wires, and therefore their magnetic effect, being reversed. The distortion effect is also reversed, so that there is opposition to the turning of the armature in the direction of rotation, or a tendency for the frame of the machine to turn in the direction of rotation.

This tendency for the frame to turn is the principle used in the Remy generator in question, and to utilize this tendency, the frame as well as the armature is mounted on bearings so that it can rock, due to this reaction.

It is an established electrical fact that the force of this reaction is directly proportional to either the field strength or the current, so that variation in either one will control the tendency for the frame to rock on its bearings.

Action of Generator With Frame Supported on Bearings

In normal action, as the engine speed increases (driving the generator faster), there will be more charging current going to the battery. This current, however, comes from the armature wires, and increase in this current increases the torque reaction, causing more tendency for the frame to rock. The frame motion is controlled by a spring which is opposed by the magnetic action just described. Increased output, therefore, rocks the generator, which, being connected by lever arms and a rod to the throttle, operates to cut off the fuel supply to the engine to the point where a certain fixed speed is maintained.

Referring now to Fig. 5, we see that not only is the armature free to turn, but that bearings are also provided to allow for the rocking action of the frame. One of the frame bearings is visible at the left while the other is not visible but is inside the housing at F. In the right-hand view of Fig. 6 a spring will be seen holding the generator frame in such position that the throttle is held open. At the lower end of this spring will be seen a piston, K, which moves with the action of the spring, in a space filled with oil, there being a passage, L, through which the oil can flow to and from the generator. This dash pot construction is used to prevent a too sudden operating of the governor, which would give jerky operation.

Just above the arrow head from the letter L is a screw which can be turned so as to more or less fill up this oil passage. This is for the purpose of slowing down or speeding up the

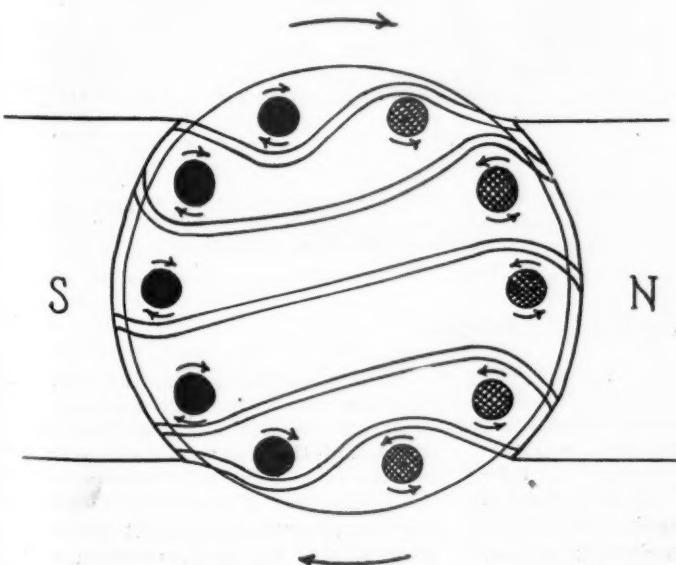


FIG. 3

DISTORTION OF MAGNETIC LINES OF FORCE WHEN MACHINE OPERATES AS A MOTOR

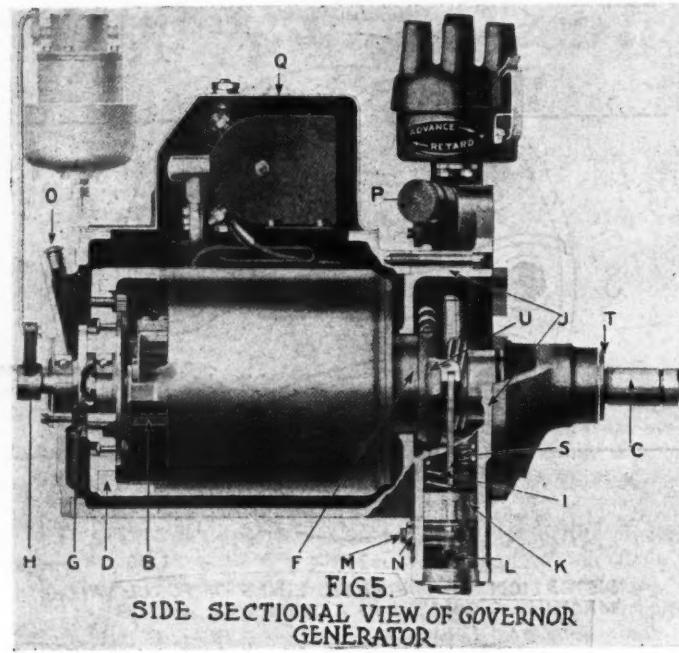


FIG. 5.
SIDE SECTIONAL VIEW OF GOVERNOR
GENERATOR

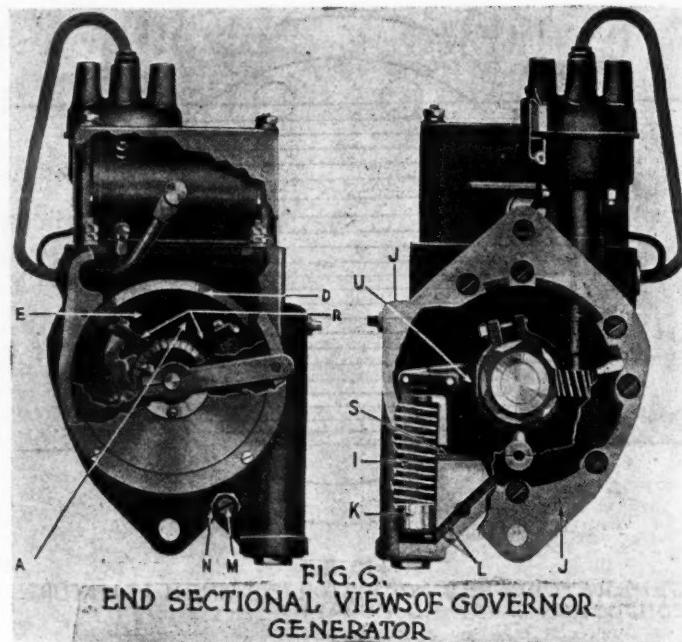


FIG. 6.
END SECTIONAL VIEW OF GOVERNOR
GENERATOR

governor action. If the governor is too sudden in its action the screw is turned in, and if too slow is backed out somewhat.

In Fig. 7 is shown the complete assembly of the generating and governing outfit on a tractor engine, the speed control and switch box being at the right. The handle on the speed controller operates a rheostat which is in series with the shunt field of the generator, the slow position being the one where the field current is the greatest, while the high speed position is the one where all of the resistance is in circuit and the field current is therefore weak. This means that in the high speed position the armature does not generate much voltage until, due to the weak torque, and the open throttle due to spring action, a higher speed is attained and a condition of balance is reached.

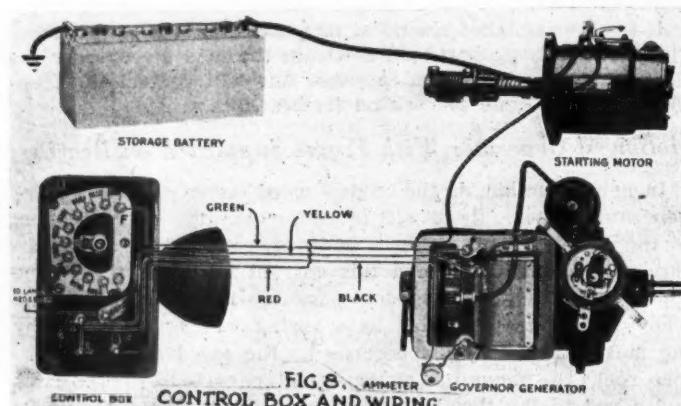


FIG. 8.
AMMETER
CONTROL BOX
AND WIRING

The back of the control box is shown in Fig. 8, together with a view showing the wiring. The ammeter indicated is not part of the regular equipment, but indicates the correct connection for testing. The dotted line gives the correct connection when the ammeter is not being used.

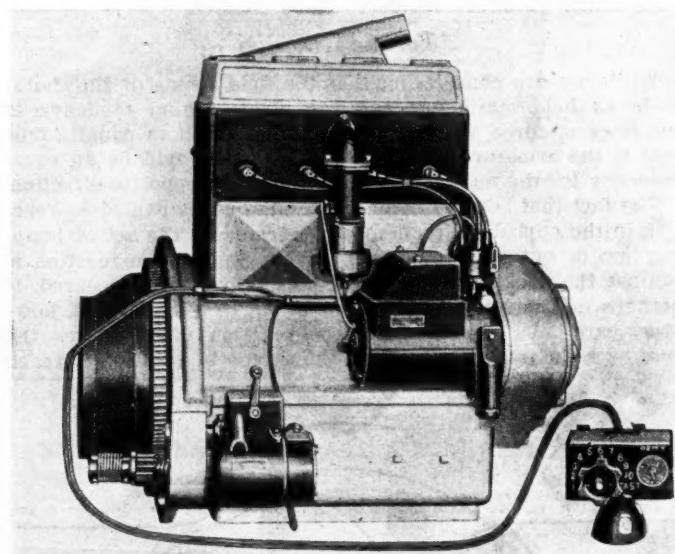


FIG. 7.
ASSEMBLY OF GENERATING AND GOVERNING
OUTFIT ON TRACTOR ENGINE.

Novel Method of Selling Trucks

An unusual sales program has been put in use by Richard Drake, truck sales manager of the Chaddick Automobile Company, Oldsmobile distributors in San Antonio, Texas.

Mr. Drake declares that the character of the country is such that it has often been found that a salesman would take an Oldsmobile truck many miles out into the country to interview a prospect. It has been found, he says, that the sale could not always be completed in a single day and it was equally impossible for the rancher or farmer to ask him

to have dinner with his family or spend the night there.

In view of this situation, Drake has fitted an Economy Truck with side curtains, two three fourths width beds, mattresses and bedding, which fold up when not in use during the day. A duofold is also used as seat for day travelling and can be used as another bed at night, so that six people in all can be accommodated.

A four burner kerosene cooking range, with an oven, a large ice box, a folding table, several camp chairs with arms are

all part of the equipment. In addition to this, a two foot width space in the top of the covering has a six foot floor clearance so that the occupants can walk from one end to the other without stooping. On either side of this clearance space are two compartments, running the full length of the body, where a complete line of cooking utensils, dishes and linen is carried.

This truck is used by the salesmen of the company for the purpose of camping right on the ground of a prospective customer.

What the Automobile Dealer Should Mean to the Car Owner

The Local Representative of the Car Is the Man Who Insures Performance at the Same High Level, Says N. A. D. A. President

RECENTLY W. J. Brace, President of the National Automobile Dealers' Association and Hudson-Essex distributor at Kansas City, was asked by the powers controlling the radio broadcasting, to speak through the radio on the relations of the automobile

dealer to the car owner. It was arranged that this address should be duplicated through all main broadcasting stations at the same time, a local dealer doing the talking, at other stations than the one at which Brace made the master address. Brace made the talk on the after-

noon of Oct. 12 and it was duplicated in many other stations.

This address is printed here for two reasons: It sets forth the high ideal that every dealer should accept as his own, and it also sets forth in a new way the plan of action of the N. A. D. A.



By W. J. BRACE

President of the National Automobile Dealers' Association

THE motor car owners of America and those of you who will some day be motor car owners are undoubtedly very much interested in what the motor car dealers are doing to make it more pleasant and profitable to own a motor car, to make it possible for you to receive 100 per cent car satisfaction.

Service means keeping your automobile at the same high level of performance it was capable of when you received it as a new car. This has not always been understood in the past but there is a large and growing appreciation upon the part of the progressive dealers of the country that this is an obligation that was created between the dealer and owner at the time of the purchase of the car.

The National Automobile Dealers' Association is an organization of the highest type of automobile merchants. Its membership is restricted to automobile dealers who have been and are conducting their business in an honorable and efficient manner. No other kind can obtain membership in the organization.

No dealer is admitted to membership in the National Automobile Dealers' Association who does not own and operate an adequate service station. These dealers have acknowledged that they owe the obligation to their car owners to keep the car rolling the maximum number of days a year.

These high grade automobile merchants are banded together to provide to the motor car owners, a standard of measurement, by which the motor car owners and the prospective buyers of motor cars can decide for themselves, who are the automobile merchants with whom they can spend their money, confident of getting a square deal and full value for your money.

If the motor car buyers and owners will insist on spending their money where they can be sure of square dealing and full value for their money, they

will very quickly bring about the result for which the N. A. D. A. is working. The motor car owners, by that method can very quickly make it absolutely necessary for every man who expects to successfully sell motor vehicles, to conduct his place of business along the lines which the N. A. D. A. says are necessary for the fullest protection to the motoring public.

In every large city and in every state there is a small number of automobile merchants who have had a long life in this business. Through this long period of usefulness to the automobile owners they have demonstrated their personal integrity, honesty and ability.

These are the men who make up the membership of the N. A. D. A. The standards by which they have been measured by their customers, are the standards which have been set up as the measurement which the motoring public can apply in choosing an automobile merchant, who should be as carefully chosen as your banker, your stock broker, your real estate agent and your insurance agent.

The fact that a man has been in the automobile business for a number of years, that he is successful and conducting his business on successful methods, and is equipped to stay in business through a long period of years is worth a lot of money to the customers of that man. And by the same measure it is worth a lot of money to those persons who have been and are now customers of the other kind of dealers.

The first prime essential in the purchase of a motor vehicle is to choose the dealer with whom you are going to spend your money. The average selling price of an automobile is somewhere around one thousand dollars. Comparatively few persons spend one thousand dollars very many times in the span of life. The man with whom it is to be spent should be carefully chosen.

There is a standard of measurement by which you can be guided in the buying of life insurance, in buying stocks, in buying real estate, in choosing a bank. And there is now a standard of measurement by which you can choose your automobile merchant.

You can now make sure that the automobile merchant with whom you are going to deal, is a business man; that he reflects his personal integrity in every transaction; that he has personal ability and capacity; that he has credit and financial strength; that he is one with whom you enjoy dealing because he inspires confidence by his methods; that he handles only merchandise of proved merit; that he is courteous and that he demands courtesy of his employees for his customers; that he does not knock his competitors; that he advertises truthfully; that he is building for permanence; that he specializes for his own benefit and economizes for your benefit; that he is clear thinking and aggressive; that he knows how to conduct his business and does it; that he believes in the golden rule for himself and for his customers; that he is 'One of a Thousand.'

It is not the intention of the N. A. D. A. to say that any merchant who is not a member of this organization is unworthy or questionable. But we do say that we have investigated the merchant who is a member, and that we are satisfied that he is conducting his business in a way to give the greatest satisfaction and value to his customers.

Such a man generally will be found to be a member of the N. A. D. A. and we present this little story of our work to the automobile owners of today and of the future, in the hope and in the faith, that this work which has such a definite and vital bearing on you and your satisfaction in your automobile, will prove to be a definite asset to you and to the entire business structure of the nation.

MOTOR AGE'S PICTURE PAGES



Who can "remember way back when," in 1903, Henry used to advertise like this?

**Don't experiment—
Just buy a FORD**

In addition to Henry Ford's originality of design there is more actual value of material and workmanship in FORD MODEL "T" than in any other automobile ever built at the price.

It seats five people, climbs hills on high speed, has a roomy side entrance tonneau, is light, strong and rides like a Yacht. Has the latitude of speed on the high gear, of a \$5,000.00 car. Do not be deceived by "Horse Power TALK." Make it your business to see what THIS car will DO.

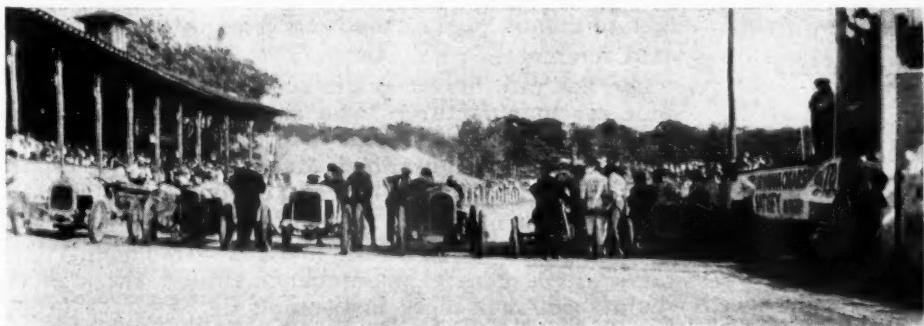
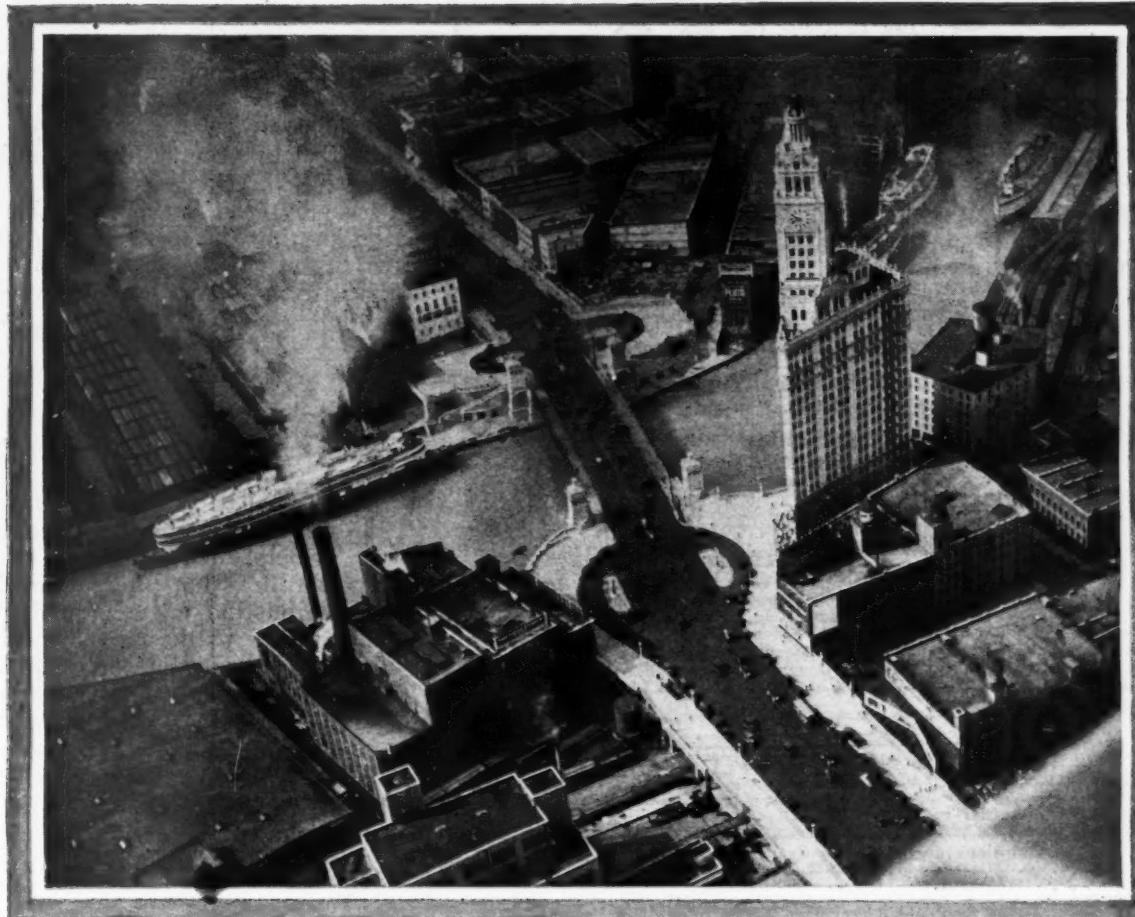
Ford's first advertisement of this in comparison with other cars and see the difference between value and power and economy. Write for booklet on "Motoring giving back 40% to the low cost of operating Ford cars."

Ford Motor Company,
Detroit, Mich.

Association outings have been most popular this summer. Above, the Indianapolis Trade Association having a big time. It is hoped that Vice-Pres. R. H. Losey and Pres. Homer Lathrop, center, and E. W. Steinhart and J. E. Trotter, end men, said also to be front line association boosters, will not miss the clam bake while posing for the camera man. Below, members of the Automotive Association of New York are resting from their gambols long enough to pose with their families and friends. This also was a clam bake, and we dare say the clams were captured alive as the outing was held on Long Island Sound



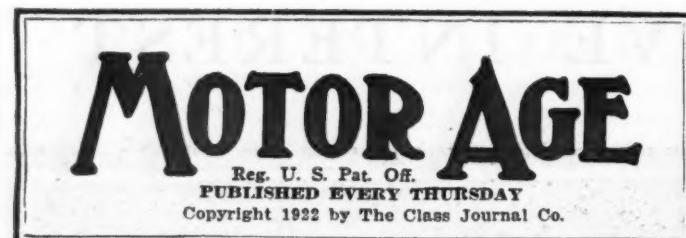
OF AUTOMOTIVE INTEREST



One of the greatest motor thoroughfares in the world. The new Boulevard Link Bridge over the Chicago river where they drive 30 miles an hour in order to get the crowds past without congestion. About 40,000 cars pass over this bridge daily, but it could handle double that number. The historic Rush street bridge formerly spanned the river here

Start of the Crown Point dirt track race which was reported as bubbling over with thrills





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The Future of Tires

A DEALER reader of MOTOR AGE writes to this magazine commanding the recent editorials on the standard of ethics in the tire business. One paragraph of his letter is as follows:

"As the retail tire business stands today, no business man of normal judgment would think of investing his money in such an enterprise and those who already have made investments are sick and tired of it. As a consequence, the standard of retail tire dealers is constantly getting lower, and the few legitimate dealers who are left are having an awfully hard time making ends meet. Between illegitimate competition, insufficient margin of profit and the total disregard by the manufacturer of dealer interest, it is only a matter of a very few months until the entire retail end of the tire business will be totally demoralized."

MOTOR AGE does not believe that the situation is quite as serious as this dealer presents it, for we believe that we know of some manufacturers who are keenly alive to the needs of the dealer for protection of his lines and for assistance in his work of building up a local reputation for the tires that he is selling. Some of these manufacturers are building an excellent reputation for their prod-

ucts in certain sections of the country and their selection of dealers has much to do with this reputation.

One great trouble with tire manufacturers appears to be that they have ignored the well established merchandising fact that as much as 97 per cent of the sale of an article is admitted to be due to the dealer indorsement, of even widely advertised articles equal in value to tires. Under present conditions, considering the number of tires made and the great proportion of them that are the "best," it would seem to be rather silly of a manufacturer to believe that by general advertising he can make much of an impression.

It would seem, on consideration of the present confusion in this trade, that the manufacturer would do better to put more dependence in the satisfied dealer and less in a general sales appeal than he has in the past.



"Keep thy shop and thy shop will keep thee."

**Looking to the Flat Rate**

MOTOR cars as they are built today do not differ radically one from the other as far as general principles of construction are concerned. The person who does not understand the theory of the internal combustion engine, or the transmission of the engine's power to the drive wheels, is totally unfitted as a maintenance operator. This being perfectly obvious, let us go a step farther and state that the operator who is acquainted with the theory of the internal combustion engine and the transmission of its power is not necessarily an efficient maintenance operator.

The day is gradually if not rapidly approaching when the establishment doing general maintenance work must do it at a price comparable with the flat rate price established by the manufacturer or the manufacturer's service representative. It will mean that the general maintenance establishment must secure as much as possible on each car manufactured so that not only the general theory of construction but the particular and definite details of its construction be available for instant reference.

The flat rate movement is receiving the support of some car manufacturers who are supplying their isolated service establishments with the necessary information for its inauguration. Many large service establishments are, by a study of repeated operations, formulating their own flat rate system.

Nothing has been done towards establishing the status of the general maintenance station although it would seem that these institutions are a factor to be considered. It is next to impossible for each car manufacturer to establish a direct service representative in each town in the United States. There will always be a number of owners of his make of car in towns where there are no factory or agents' maintenance facilities. If, through a lack of specific maintenance knowledge, the service and repair bills on a car are not comparable to the manufacturer's flat rate, it will react unfavorably to the manufacturer, of that car.

It is realized that it would be impractical for the general maintenance institution to install the very extensive special equipment that would be necessary to exactly follow out the flat rate system laid down by every manufacturer; but if the high grade general maintenance establishment possessed the necessary working guide, that would tell him exactly the sequence of operations necessary for each repair, it would save much unnec-

essary disassembly of units and would be a distinct saving to the car owner and station proprietor.

Installing a set of new piston pins in the Peerless car costs the car owner \$17 at the Peerless service station but the same job at the general maintenance station would cost \$24, not because they laid down on the job but because they did not know the most efficient method of procedure.

If the general maintenance station owners are not to be considered by the manufacturers they, the owners, should be devoting some hard thinking to the subject. If they can't secure the manufacturers' flat rate data they should make a systematic effort to gather what information is available such as instruction books, detail drawings and the instruction bulletins and books issued by the unit parts makers. Doing any job well is the first item to consider but doing the job well in such time that it compares with the best practice for that particular car is another brick in the road to permanency.



"Would you persuade, speak of interest, not of reason."



Standardizing the Educational Work

In connection with the annual meeting of the Federal Board for Vocational Education in Detroit next month, a session will be devoted to the consideration of a worth while course for automotive mechanics. Many vocational educators are expected to attend this meeting and all men in the industry who are interested are invited. The object is to define a course that will properly equip the youth to take a job in a maintenance shop, understandingly. This course should be so designed as to serve for what was once an apprenticeship system in most crafts, but which has never existed in the automotive maintenance industry.

Today there are too many ideas as to the proper schooling of the youth who plans to repair automotive vehicles. There are schools that offer a regular ten week's course and which, if their literature is written in plain English, guarantee that their graduates are expert mechanics. Frequently some of these schools advertise a special or bargain course in which mechanics are guaranteed in eight weeks intensive work. These men usually are "equipped to work on automobiles, trucks and tractors."

On the other hand there are schools which require two school years of work from the student and then guarantee nothing, but say that this student should be adequately equipped to enroll as a beginner in the automotive maintenance shop.

The chief difference between these schools is that the short course schools regard the student as an asset from a money making standpoint and the others regard him as a liability. The latter schools are usually endowed or have access to state funds.

Most employers in this field have come to regard any graduate with suspicion and the youth from a two year school has little more opportunity of obtaining a job than the graduate of a bargain school. It is time that some definite opinion was passed on this question and that a more or less definite standard was established. MOTOR AGE believes that this can be done by such a conference as will be held in Detroit on November 29. It is with a good deal of pride that MOTOR AGE realizes that this conference is being called as a result of the efforts of the editorial department of this magazine.

Automotive educators, manufacturers, engineers, maintenance experts and writers are invited to attend this conference and assist in the effort to bring order out of the present chaos.



"He that waits upon fortune, is never sure of a dinner."



Dealer Warns Fellows

Some months ago an automotive dealer company in a northwestern state needed some money to tide them over until better conditions come to that section of the country. The dealers wanted a loan for a longer period than the banks in that community were willing to grant. While the dealers were studying various plans, an investment banking house representative was a visitor and he suggested a bond issue.

This plan looked so good to the dealers that they submitted a statement to the bankers—a Chicago firm this happened to be—and the bankers said that it was an excellent plan and they would be glad to handle it. The banking firm sent a man to investigate the dealers (at the dealer's expense), approved of the showing made and assured the dealers of the success of the issue, printed the bonds and presented a bill for several hundred dollars, and then withdrew. This firm, despite promises, made no effort to dispose of the bonds.

These dealers are inclined to be critical of an industry which leads them into financial difficulties, due to merchandise prices being cut without warning, and does not make any arrangement for carrying the dealer who is stocked up and who will be solvent if given time to work himself out of the troubles. Several financial agents who happened along promised much but delivered nothing. The message these dealers want carried to fellow dealers is:

Beware of the bond houses. They charge you fancy prices for printing but have no service to offer you.

This case is not an isolated one, as MOTOR AGE learns that other dealers have been induced to try this method of financing and have had only bills to pay.



"Well done is better than well said."



Old Man Pinch Penny

You've heard of the fellow who was so "tight" that he'd squeeze a penny till you could hear the Indian yell? Well, there's an old chap who has charge of a gas station near Chicago who is known to many motorists as "Old Man Pinch Penny." He's typical of the man they tell about in the funny stories.

Here are some of his traits. When a car pulls up and the driver orders his fuel, the old fellow pumps up the amount into his visible tank, which is so arranged that after you place the dial at a certain amount, you couldn't get a drop over that amount in the tank if you were to pump till Caesar traded his chariot in for an automobile. But the old man puts on his glasses and gets up on the stand and looks from all angles to see that everything is all right, and then he cautiously lets the fluid out.

When the driver pulls away, he has a pail that he puts the hose in to get all the drainings, literally letting the hose run dry. These he carefully puts back in the tank and does not attempt to make a secret of it. People liked to go there for a while just to see this oddity of nature but its getting to be a bore now and the machines no longer stop. Don't be too saving, it's bad to look at.

Dealers Urged to Work for Tax Repeal

N. A. D. A. Takes Up Fight Against War Levies on Cars

Graphic Exhibit Shows How Auto- motive Industry Has Been Dis- criminated Against

ST. LOUIS, Oct. 16—In a letter addressed to all automobile dealers the National Automobile Dealers' Association requests them to join in the movement to induce Congress to repeal the excise war taxes on automobiles and automotive products.

In support of this movement the N. A. D. A. has prepared a graphic exhibit showing by comparison the Federal excise taxes of 1918 and 1921. It is shown that in 1921 many of the excise taxes were repealed or reduced, but those on the automotive products remained the same.

Write to Congressman

The N. A. D. A. requests every dealer to write to his Congressman and the candidates for Congress in his district, asking that when Congress meets in December these automotive taxes be repealed. The association wants copies of the letters the dealers write so that it can map out a comprehensive program for the active campaign that is to follow.

Following is the letter of the N.A.D.A.: The war has been over for four years yet the automobile industry is still paying WAR TAXES. Three per cent upon trucks and five per cent upon automobiles, accessories, tires, parts, etc.

This is a tax upon transportation. Congress recognized in the 1922 revenue bill that taxes upon transportation were unwise by REPEALING the tax upon railroad transportation. But no relief was offered to the kind of transportation furnished by the motor vehicle.

"Menace to Industry"

In the recent tax bill revision, Congress absolutely removed the taxes from musical instruments, sporting goods, chewing gum, thermos bottles, fur goods, toilet soaps, picture frames, perfumes, hair dyes, toilet waters and patent medicines, but the tax upon transportation furnished by motor vehicles remains:—a burden and a menace to the automobile industry.

Congress is now in adjournment. When it reconvenes this winter we want behind us the united support of the automobile dealers to remove this burden from our industry.

You can help us do it. We want you to address a personal letter to your Congressman and Senator setting forth your views on the subject and asking him to help us remove the discriminatory taxes

on the automotive industry. We want you to go a step further and address the same kind of a letter to any candidate for Congress in your district. We want to find out who among those men want to retain the burden on our industry and who will stand with us in our effort to effect repeal of the discriminatory war excise taxes that are imposing a burden of more than \$100,000,000 a year in addition to all other taxes upon the sales of our products.

Will you do this? Every substantial automobile dealer in the United States is being asked to join in this effort for the industry. If you will do your part, I think the result will surprise all of us.

When you have done as we have asked, send us a copy of your letter and all copies of the replies. From the information gained from these sources, we will map out our campaign of action.

The war is over. Let's rid ourselves of the war taxes.

Yours for fair treatment of our industry,

NATIONAL AUTOMOBILE DEALERS' ASSOCIATION,

W. J. Brace, President.

P. S.—Address all replies to headquarters, 320 No. Grand Avenue, St. Louis, Missouri.

GENERAL ELECTRIC INCREASES

NEW YORK, Oct. 16—Stockholders of the General Electric Co. have notified that orders for the three months ended Sept. 30 show an increase of 42 per cent over the same period in 1921, the totals being \$58,914,620 in 1922 as against \$41,608,332 in 1921. For the nine months ended Sept. 30 there has been a 30 per cent increase with \$176,171,194 in 1922 as against \$135,256,462 in 1921.

Discriminatory War Excise Tax Laws of 1918 and 1921

Repeals in 1918 law indicated by —
Changes in 1921 law indicated by *italics*

SECTION 628.

There shall be levied, assessed, collected and paid:

- a. Upon all cereal beverages ~~a tax equivalent to 15 per cent. a tax of 2 cents per gallon.~~
- b. Upon all mineral waters and soft drinks ~~a tax equivalent to 10 per cent of the price, where sold over 12½ cents per gallon, a tax of 2 cents per gallon.~~
- c. Upon ice cream, etc., ~~a tax of 1 cent for each 10 cents. Tax of 9 cents per gallon on fountain sirups, upon carbonated beverages and 4 cents on carbonic acids.~~

SECTION 800.

There shall be levied, assessed, collected and paid a tax of 1 cent for each 10 cents for amount paid for admissions to any place *except that there shall be no charge where the admission is not more than 10 cents*

SECTION 900.

There shall be levied, assessed, collected and paid a tax of:

- a. 3 per cent on all automobile trucks, tires, parts, and accessories.
- b. 5 per cent on all other automobiles, tires, parts and accessories.
- c. ~~5 per cent on musical instruments.~~
- d. ~~10 per cent on all sporting goods.~~
- e. ~~3 per cent on chewing gum.~~
- f. 10 per cent on cameras weighing not more than 100 pounds.
- g. Licenses for cameras, films and plates 5 per cent.
- h. Candy ~~5 per cent, 3 per cent.~~
- i. Firearms and knives 10 per cent.
- j. Daggers, stilettos, etc., 100 per cent.
- k. Thermos bottles, etc., ~~5 per cent.~~
- l. Cigar and cigarette accessories 10 per cent.
- m. Automatic vending machine 5 per cent.
- n. Automatic weighing machines, 10 per cent.
- o. Liveries and livery boots and hats, 10 per cent.
- p. Hunting and shooting garments, 10 per cent.
- q. Articles made of fur, ~~10 per cent.~~
- r. Yachts, motor boats, canoes, etc., sold for more than \$15, ~~10 per cent \$100, 10 per cent.~~
- s. Toilet soaps and powders, ~~3 per cent.~~
- t. Sculpture, paintings and bronzes, 10 per cent, ~~5 per cent.~~

SECTION 904.

There shall be levied, assessed, collected and paid a tax on:

- a. Carpets and rugs ~~10 per cent of an amount in excess of \$6.00 per yard. Five per cent in excess of \$4.60 per square yard on carpets. \$6.00 per square yard on rugs.~~
- b. Picture frames ~~in excess of \$10.00, 10 per cent.~~
- c. Trunks, valises, purses, lightning fixtures, umbrellas and fans in excess of varying amounts, ~~10 per cent, 5 per cent.~~
- d. Men's and women's wear in excess of varying amounts, ~~10 per cent, 5 per cent.~~
- e. Jewelry, 5 per cent.
- f. Licensing motion picture films, ~~5 per cent of total rentals.~~
- g. Perfumes, toilet waters, hair dyes, etc., ~~1 cent for each 25 cents.~~
- h. Patent medicines ~~1 cent for each 25 cents.~~

Production Continues at High Rate

Ford Denies That He Will Buy More Automobile Plants

Declares Company Will Not Produce New Model; Talks on Muscle Shoals

DETROIT, Mich., Oct. 16—Henry Ford denies emphatically in an interview with Automotive Industries that he proposes to buy any additional plants.

"We've got enough to do now and are not going to buy any more cars or factories and that applies to the Wills car and the Wills plant. Why should we try to get any company out of the field? They all make business for us and we make business for them."

When asked if he could tell anything about his plans for a new car, Ford said, "What new car? I hadn't heard of any. We can't build enough of the ones we are making now, we're trying to get production up to 5300 a day. We shall make no more tractor models, but will stick to the one we have."

Ford declared his company would use no more aluminum in its products until it produced the metal itself. This may be done at Muscle Shoals, if his offer is accepted by the government. In discussing the highway question, Ford said:

"The best way to get good roads is to load trucks to their full capacity. When the roads won't stand up under these loads the people will realize they must build heavier highways to carry the traffic. One of the best ways to kill foolish opposition to spending money for better roads is for a few of the old fogies who are standing out against it to die off."

"This applies not only to good roads but to most forward looking projects." Ford was asked what he expects will happen with the constant increase in the number of motor vehicles in use now that highways in some places seem to be carrying about all they'll hold.

"We'll have to build more roads," he said, "of course, there will have to be two lines, one for traffic in each direction."

Ford asserted that he had not yet begun to fight for Muscle Shoals but he seems to feel confident that his offer for it will be accepted. If it is, he will use all the power developed and expects to employ one man for every horsepower. There are approximately 1,000,000 in sight. He has not worked out in detail what he will do to utilize the energy developed and says he will be unable to do so until he gets at it.

Ford is intensely interested in the development of water power projects in all parts of the country and will devote much of his attention to this subject in the future.

FORD ANNOUNCES \$50 CUT

DETROIT, Oct. 17—The Ford Motor Co. announces a \$50 reduction on all of its models, as follows:

Model—	Old Price	New Price
Chassis	\$285	\$235
Runabout	319	269
Phaeton	348	298
1-Ton Truck Chassis	430	380
Coupe	580	530
Sedan	645	595

PAN RECEIVERS APPOINTED

ST. CLOUD, Minn., Oct. 16—Edward E. Clark and R. E. Gale have been appointed receivers for the Pan Motor Co., following the filing of a suit for \$30,000 against the concern. Assets, apart from deferred capital stock and good will, were given as \$2,633,385, with liabilities of \$506,061.

Fluctuation in Prices Causes Uneasiness to Banks

DETROIT, Oct. 14—Fluctuations in automobile prices are being viewed with considerable disquiet in banking circles, according to a factory executive of one of the largest companies in Detroit, and some little difficulty may be experienced in financing dealer shipments during the fall and winter unless some sort of guarantees are given that further revisions are not contemplated. The condition applies particularly in the east, where this executive has been in touch with banking officials.

New prices and new models have practically wiped out used car valuations, he said, and many dealers are liquidating used car stocks at prices which must be made up on new car profits. Too little consideration has been given the condition of dealers' stocks in bringing out new models and cutting prices. In no case where price cuts are made, he said, should they exceed the amount of dealer discount.

DIRT TRACK FOR HOOSIERS

INDIANAPOLIS, Oct. 16—Construction of a half-mile dirt track is being rushed by the Hoosier Motor Speedway, near this city, and promoters say that the oval will be ready for the Armistice Day race meet that is scheduled for the opener. The turns will be banked and a dustless surfacing will be applied that it is said will make the track as hard as rock. The management claims that twenty-five entrants have been received for the 50-mile event and the shorter sprints.

WM. ULLMAN WITH N. M. A.

WASHINGTON, Oct. 14—William Ullman, for eight years editor of American Motorist, publication of American Automobile Association, and director and secretary of the National Capital division of that organization, has been named head of the local district of the recently organized National Motorists' Assn.

Record of 2,276,000 In 1920 Likely to Be Exceeded

Manufacturers Prepared to Sustain Output Through Remaining Months of Year

NEW YORK, Oct. 16—The automotive industry has entered the final quarter of the year with assurances that no matter what may happen to retard progress during this period the total production of cars and trucks for the twelve months will surpass the 1921 aggregate and from all indications will forge ahead of the record established in 1920, the banner year in the industry.

What the industry has accomplished in production so far this year is evident from a comparison of the totals for the last two years and for the first three quarters of 1922.

In 1920 there were produced 2,276,000 cars and trucks of which 1,928,000 were built in the first nine months, the slump which affected all lines of business seriously hitting the industry in the last quarter. The total output in 1921 was 1,668,550 and in the first nine months of 1922, 1,873,000. To reach the production record of 1920 the industry must produce 403,000 cars and trucks in the last three months of the year which is less than 60,000 under the total of the third quarter of 1920 when the industry was suffering its most severe setback, and only 68,000 more than for the third quarter of last year, which was not an exceptional period.

Another Big Year

There is little question but that this figure will be reached and that 1922 will be another 2,000,000 year. Ford, which reduced its total in September through the closing of its plants, has come back with a 5,000 daily production schedule and the majority of other plants are working on high production programs. Reports of parts makers that orders are being placed well in advance indicate the purpose of the car manufacturers to keep output at a high mark.

These manufacturers, however, are ready to start the tapering off process in operations as soon as a decline in sales comes in a sufficiently large volume to warrant it. So far, October has shown no signs of more than a slight falling off in sections widely separated. Interest has been sustained until the industry has started on its pre-show season when scattered enclosed car exhibits are having a stimulating effect on sales.

The problem confronting the industry in Detroit of securing its steel supply, due to the diversion of rail equipment for the shipment of coal, particularly to lake ports, and the transportation of

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Enclosed Car Show Opens in Chicago Dealers' Salesrooms

Virtually All Members of Trade Association Join in Move

CHICAGO, Oct. 16—The enclosed car show of the Chicago Automobile Trade Assn. opened Saturday in the various dealers' salesrooms, giving a seasonal impetus to retail sales which for two months have maintained a steady level considerably below the high point of the summer. Practically all the members of the trade association, those in the outlying communities as well as those on "automobile row," have decorated their places in keeping with the occasion and are showing full lines of their enclosed models. The trade association voted \$18,000 to be used in advertising the show and many of the individual dealers have extensively advertised their own displays.

Figures for the weekly time payment sales, compiled by the Central Automobile Finance Assn., indicate that for the last eight weeks sales have averaged approximately 20 per cent less than for the preceding eight weeks. The average weekly time payment sales for the eight weeks ending Oct. 7 was 764 and for the eight weeks preceding that period the average was 964. Time sales constitute approximately two-thirds of the total sales.

In the last two or three weeks there have been no signs of a further decline and indications are that any change will be upward. Interest in enclosed cars has become greater and this week's show will undoubtedly result in many sales. Enclosed cars are now about 50 per cent of total sales.

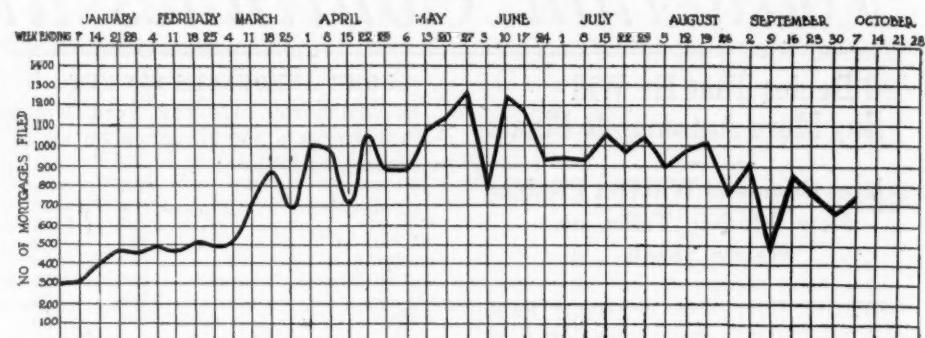
On the whole, sales this month and next are expected to be good in passenger cars, but only fair in trucks. As compared with a year ago, sales are much better and in some cases the volume is double. The used car market is slow.

Continued from page 31

farm produce, will probably be solved by the employment of motor trucks between Pittsburgh, the principal source of supply, and that city. This condition is expected to continue until the closing of lake navigation. The success of the plan will remove one of the chief obstacles in the way of sustaining production at a high figure. Materials are reaching Detroit with only slight interruption, not great enough to prove a serious deterrent.

Light duty trucks continue to gain in demand, due directly to the coal situation and the apportioning of supplies to householders in small quantities. These vehicles are showing a stronger growth than is noticeable in the heavier trucks, which, however, are more than holding their own.

Table of Time Payment Sales In Chicago



GOOD TIMES FOR TIRE MAKERS

CHICAGO, Oct. 13—Better times ahead for tire manufacturers in the midwestern group were predicted by W. W. Wuchter, president of the Midwest Rubber Manufacturers Association, at the association's monthly meeting here Tuesday. He declared that within six months those companies which are able to continue operation will see improved conditions under which they will be able to make money.

The association voted to hold its November meeting at St. Louis, the place to be announced later.

Manufacturers were urged to advise their dealers to operate on a cash basis only, by Dr. R. P. Shepard, economist, representing the Chicago Association of Commerce. "The retailer who extends credit to his customers ceases to be a merchant and becomes a banker," he said. "It is not fair for the customers to ask the retailer to loan them a part of his capital. They should borrow the money at the bank and pay cash for their purchases." He advised the use of the trade acceptance to put credit business on a cash basis.

LIGHTS FOR HORSE VEHICLES

CHARLOTTE, N. C., Oct. 15—W. H. Pharr, president of the North Carolina Farm Bureau, says the bureau has had a bill prepared to present to the next session of the North Carolina legislature, which meets in January, to prohibit any horse drawn vehicle from appearing on the public highways of the state at night without lights. Such legislation is necessary, he says, not only for the protection of the automobile drivers, but more especially for the protection of the buggies and wagons and their drivers themselves.

MOON'S BEST SEPTEMBER

ST. LOUIS, Oct. 16—The Moon Motor Car Co. has closed the most successful September in the company's history. More cars were sold in this one month than were sold in the last five months of 1921. The production schedule for October calls for 1,025 cars.

Production at the present time is divided equally between enclosed cars and open cars, but were it possible to secure deliveries on enclosed car materials, production would be 75 per cent enclosed cars and 25 per cent open cars.

Fair Drivers to Compete in Chicago Show Contest

CHICAGO, Oct. 16—An automobile driving contest for women will be held next Wednesday in connection with the enclosed car show of the Chicago Automobile Trade Assn. Each dealer participating in the show will be entitled to select two women drivers of his cars to enter the contest. Each contestant must drive an enclosed car of the 1922 model.

An object of the contest will be to demonstrate to the public that the modern automobile can be driven with safety and comfort by the average woman. There will be four events in the contest: A drive around the boulevard system, obeying all city, state and park traffic rules; road control, determined by bringing the car up to a line at 25 miles an hour and stopping the front wheels as nearly as possible on another line 75 feet away; parking at the curb in a space only one and one-half times the length of the car's wheelbase, and backing into a space in a public garage.

Contestants will be divided in three classes, cars listing at \$1500 or less, those between \$1500 and \$3000 and those over \$3000. A \$100 merchandise certificate will be awarded the winner in each class.

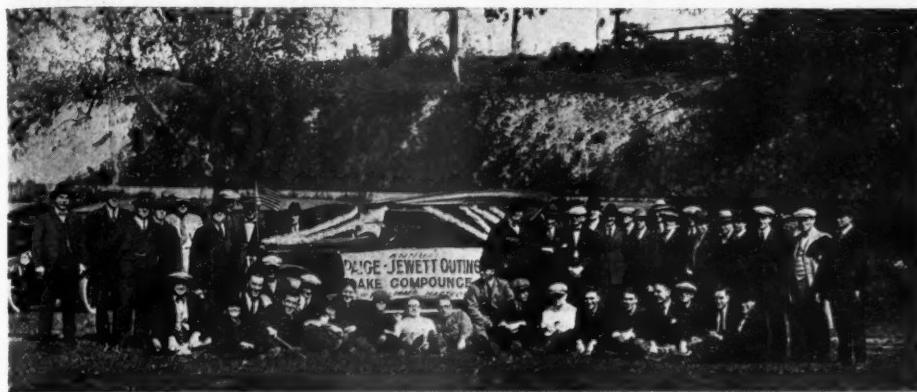
PROMOTIONS IN BUICK SALES

FLINT, Mich., Oct. 16—Promotions in the Buick sales department have been announced by E. T. Strong, general sales manager. Those who have been advanced are J. A. Coy, who has been made district sales manager for Michigan; James Dickson, Jr., as Detroit branch manager in charge of wholesale distribution of cars outside Detroit, and E. M. Steger, as sales manager in charge of all sales in the city of Detroit.

75 PER CENT DRIVEAWAYS

SPRINGFIELD, O., Oct. 12—"About 75 per cent of our business during the past week has been driveaways" said Karl Heinzen, advertising manager of The Westcott Motor Car Co. "We are under good production and the outlook is fine." The recent driveaways have gone to Peoria, Ill., Cincinnati, Cleveland, Columbus, Pittsburgh, Utica, N. Y., Detroit and Chicago.

Distributor Gives Outing for Sales and Service Force



HARTFORD, Conn., Oct. 14—F. W. Williams, Paige and Jewett distributor, entertained his entire sales and service

force last week with a sheep bake at Lake Compounce. There were various athletic events on the program.

SEAMAN BODY CO. ENLARGES

MILWAUKEE, Wis., Oct. 16—Issuance of a building permit reveals that the addition for which ground has been broken by the Seaman Body Corp., Milwaukee, will exactly duplicate the original factory erected about two years ago. The new building will be 225 by 425 ft., five stories and basement and the cost, without equipment, is given as \$300,000. The original structure cost in excess of \$500,000. It is situated at 1732-1764 Richards Street.

The Seaman company, formerly the W. S. Seaman Co., is a pioneer manufacturer of enclosed bodies and is now producing also open bodies. Charles W. Nash is a large stockholder. The additional facilities are required by the increased demands for bodies by the Nash six works at Kenosha, the Nash four works in Milwaukee, and the LaFayette plant, now being erected adjacent to the Nash four works and scheduled to be completed about Dec. 1 or Jan. 1, when the LaFayette operation will be transferred in its entirety from Indianapolis to Milwaukee.

HARROUN COMPANY BANKRUPT

DETROIT, Oct. 14—The Harroun Motor Car Co., of Wayne, Mich., has been adjudged bankrupt by Judge Little in the Federal Court. Although the creditors petitioned to have the concern declared bankrupt some years ago, court proceedings have been delayed until now because the directors believed that they could put the concern on its feet if granted time.

STATE AUTOMOBILE INSURANCE UP

PHILADELPHIA, Oct. 12—At a meeting held here at the Underwriters' Association of the Middle Department, attended by nearly 200 representative insurance men and executives, a movement was launched to combat proposed legislation which would make a compulsory State automobile insurance fund and force all motor vehicle owners to purchase their insurance from the Commonwealth.

Sales Analysis Shows Decline in New York City

Seasonal Slump Is Apparent in Figures Produced by Publisher

NEW YORK, Oct. 14—The seasonal decline in the metropolitan district is apparent in the registration figures for September as compiled by Sherlock & Arnold, publisher of the Automobile Sales Analysis, for the 10 counties in and around New York City. Total registrations for the month were 5,103 as compared with 6,438 in August and 8,494 in July. For the first nine months of the year, registrations aggregated 59,613 as against 39,366 for the same period a year ago.

Four makes lead in the low and medium priced class field, with five falling not far behind and showing sales substantially greater than the remainder of this class. Ten cars in the high priced class are well ahead in the fields.

A summary of registrations for the first nine months in the high, medium and low priced classes is as follows:

	Medium and High Price	Low Price
January	233	2,016
February	273	2,231
March	632	6,354
April	862	8,428
May	961	8,470
June	865	8,203
July	678	7,816
August	516	5,922
September	511	4,592

"DRIVE-IT-YOURSELF" TAXI

BIRMINGHAM, Ala., Oct. 16—An innovation in the drive-it-yourself taxicab business, in so far as Birmingham is concerned, is contained in the announcement of the organization of the Drive a Nash Yourself Co., which will operate from the garage of the Whitman Taxicab Co., P. Y. Whitman being the head of the new concern.

This concern starts in business with an entirely new fleet of Nash cars. It is planned to qualify all possible users under the examination system before they are allowed to take one of the cars out.

WILLS NOT OWNED BY FORD

MARYSVILLE, Mich., Oct. 16—In the "Gray Goose," the house organ of the C. H. Wills company, denial is made by C. H. Wills of the various rumors that his company has been purchased by Henry Ford. He declares that there is no foundation for such rumors and that he is not even considering joining the Ford organization. He requests his dealers everywhere to aid his denial.

CORRECTION

The Bearings Service Co., with general offices in Detroit, denies that the business of its Milwaukee branch will be taken over by the Bearings and Gears Sales Co., as stated in a news item in the Oct. 5 issue of MOTOR AGE.

Yellow Cab to Organize Company to Make Busses

New Chicago Bus Operators to Be Headed by Fifth Avenue Officials

CHICAGO, Oct. 14—Announcement that motor busses are to be built on an extensive scale by a subsidiary of the Yellow Cab Mfg. Co., makers of Yellow taxicabs, was made here by John Hertz, president of the cab company and also head of a syndicate which recently purchased the Chicago Motorbus Co. Bus production will start, as soon as manufacturing preparations are completed, on an order for 300 cars for the Chicago bus company. The busses, however, will be sold throughout the United States under a plan similar to that for the widespread sale of Yellow cabs.

Two former officials of the Fifth Avenue Coach Co. of New York will be in active charge of the Chicago Motorbus Co. under the new ownership, and also will be actively connected with the designing and production of the busses. They are J. A. Ritchie, president, and Col. George A. Green, chief engineer, of the Fifth Avenue company. They arrived in Chicago yesterday to take up their new connections. It is understood that Ritchie will be president and Green vice-president, of both the Chicago bus company and the manufacturing subsidiary. Green came to the United States from London, where he was engineer of the Vanguard Omnibus Co.

A line of single and double deck busses will be built. They probably will be modeled after the Fifth Avenue vehicles, in fact, a number of busses for immediate service of the Chicago bus company are under construction in New York. With the completion of manufacturing facilities here it is expected that large scale production will be started and that within a short time the manufacturing company will be ready to sell busses in other cities.

Hertz believes that there is a very large field for motor busses. "There is a demand in the United States for as many standard motor busses as there are taxicabs in operation today," he declared, "and we intend to supply that demand from Chicago. Hundreds of thousands of cars will be needed if our observations and those of our experts all over the world, are correct."

The name of the new bus manufacturing company probably will be Yellow Coach Manufacturing Co. Construction of a factory adjoining that of the Yellow Cab Manufacturing Co. is planned.

FORD BUILDS MANY BODIES

DETROIT, Oct. 12—The Ford Motor Co. now is building all of its bodies for models on which it has the heaviest production and sale at the River Rouge plant. With the termination of contracts

with the O. J. Beaudette Co., Pontiac, Mich., which formerly built roadster bodies, the Rouge plant now is building 800 of these daily.

Touring car bodies and the all-steel two-door sedan bodies of the conventional Ford sedan also are being built at the River Rouge, exclusively. The touring car body production has run as high as 3,015 daily and averages about 2,550. Sedan body production at the Rouge plant approximates 900 daily.

Bodies for the Ford coupe and for the new four-door sedan are being made by the Briggs Manufacturing Co., these being the only bodies not built by the company itself. Production of these is lower than on the other models and rounds out the daily schedule of approximately 5,000 cars daily which the Ford Motor Co. has been maintaining. Included in this total is the light truck production which runs from 400 to 500 daily.

More Than 100 Per Cent Increase in Cars Financed

CHICAGO, Oct. 16—Increase of more than 100 per cent in the volume of business handled by the members of the Central Automobile Financing Assn. in the first 10 months of this year, as compared with the corresponding period last year, was shown by the annual report submitted at the association's annual meeting last week.

In the first 10 months of last year the number of motor vehicles financed was 17,591 and in the first 10 months of this year the number was 39,308, an increase of 21,717. The association now has records of 99,000 motor vehicles financed by firms which are members of the association.

At the annual election Walter E. Heller of Walter E. Heller & Co. was re-elected president and C. L. Wolf of the Hamilton Investment Co. was re-elected secretary. Other officers elected are: First vice-president, H. M. Hurst of Monroe Trust Co., Chicago; second vice-president, A. D. Barnes of American Banking Co., Springfield, Ill.; treasurer, J. D. Purlee of Commercial Acceptance Trust.

WOULD INSULATE GAS TANKS

WASHINGTON, Oct. 14—Insulation of gasoline storage tanks by garage men, manufacturers and refiners, is recommended by the U. S. Bureau of Mines, as a result of a test made by the Bureau in conjunction with engineers of the Johns-Mansville Company. Due to improperly built gasoline storage tanks the Bureau declares that there is a daily wastage of 200,000 gallons of gasoline by evaporation from 775 uninsulated storage tanks throughout the country, "with the attendant result," says the Bureau, "that the automobile user must pay an increased price for his gasoline, to make up for this uneconomical loss."

Bankruptcy Petition Filed Against Elgin Corporation

Bank Creditors Claim Motor Car Company's Liabilities Exceed \$1,000,000

CHICAGO, Oct. 13—An involuntary petition in bankruptcy against the Elgin Motor Car Corporation of Elgin, Ill., a suburb of Chicago, was filed in Federal court here yesterday by three bank creditors. Fred E. Rummel was appointed receiver.

The company had been in the hands of a creditors' committee since Sept. 30 and efforts were being made to raise additional capital to continue operation. Since Oct. 2 the corporation had been under the management of R. W. Phelps, a representative of the creditors' committee, and the official personnel has been greatly reduced to save expenses. Charles S. Rieman is president of the company.

Petitioners for the receivership were Central Trust Co., Greenebaum Sons Bank and Trust Company, and Century Trust and Savings Bank, each with a claim of more than \$10,000. The petitioners claim the company's liabilities are more than \$1,000,000. Counsel for the company asserts that liabilities are only \$600,000 and that assets are more than \$900,000.

The Court granted the receiver permission to continue operation of the factory for two weeks, continuance of operation thereafter to depend upon the showing of the balance sheet for that period.

The Elgin company was organized in 1915 with a capital stock of \$1,500,000, which was raised in 1920 to \$5,500,000. There were about 17,000 stockholders, the stock having been sold widely to small investors.

RECEIVER FOR PARKER TIRE CO.

INDIANAPOLIS, Oct. 12—The Parker Tire and Rubber Co., which operates a tire plant in this city, was placed in the hands of a receiver. Suit in what was called a "friendly receivership case" was brought in the name of the Central Rubber & Supply Co., jobbers in mill supplies and automobile accessories. Though insolvency is not claimed, it is alleged that an emergency exists and the assets of the company are endangered by numerous debtors' claims and threatened suits. The Bankers Trust Co. was appointed receiver.

This is the second tire company to go into the hands of a receiver here in recent weeks. The Parker company was organized some five years ago and owns a well appointed, small tire plant. This plant was erected at the time of high prices, and this, with materials also said to have been bought during the high price era, are said to have been causes of the present financial difficulties.

Space Assigned to 83 Car Makers for National Shows

There Will Be 76 N. A. C. C. Members at Both New York and Chicago Displays

NEW YORK, Oct. 14—Exhibit spaces in either the New York or the Chicago national automobile shows were assigned to 83 of the 85 manufacturers who participated in the drawing here last week. Space was awarded to 76 members of the National Automobile Chamber of Commerce and to seven non-members. The non-members are Courier, Stanley, Noma, Hatfield, Rotary Six, Crawford and Climber.

As the space has been awarded, there are 79 car makers in each of the shows. Detroit electric, Sayers and Climber will not show at New York, while Noma, Hatfield and Rotary Six will not be at Chicago. For the first time no foreign cars are booked for display.

New York Show, Jan. 6-13

The New York show will, as usual, be held in Grand Central Palace, Jan. 6-13, while the Chicago show, Jan. 27-Feb. 3, will be held in the Coliseum and First Regiment Armory.

The assignment of space for the two shows follows:

New York Space	Car Name	Chicago Space
A-1	Velle	F-5
A-29	Chalmers	E-4
A-18	Lexington	G-1
A-28	Gardner	H-1
B-27	Moon	B-1
B-26	Earl	G-2
B-28	Cole	H-2
B-29	Stephens	E-1
B-12	Auburn	J-1
B-25	Columbia	O-2
B-24	Stearns	P-1
B-8	Mitchell	O-1
B-30	Liberty	E-3
B-23	Kissel	F-2
B-2	Lafayette	B-1-Y
B-16	Westcott	Q-1
B-17	R & V	M-1
B-1	Locomobile	B-2-Y
B-3	Rickenbacker	B-8-Y
B-4	Stutz	M-2-Y
B-18	Case	B-2-Y
B-15	Apperson	K-4-Y
B-31	Elkhart	Q-2-Y
B-11	Elgin	N-1
B-14	Templar	B-3-Y
B-7	Davis	Q-3
B-10	National	A-1-Y
B-6	King	A-3-Y
B-9	Barley	B-4-Y
B-13	Handley	B-7-Y
B-22	Mercer	A-8-Y
B-21	H. C. S.	B-6-Y
B-20	McFarlan	A-6-Y
B-19	Standard Steel	D-5-Y
C-3	Anderson	A-5-Y
C-15	Saxon	E-1-Y
C-19	Detroit Elec.	E-5-Y
C-5	Dorris	C-1-Y
C-4	Paterson	C-4-Y
C-6	Pilot	A-7
C-12	Milburn	E-6
C-18	Rauch & Lang	E-4-Y
C-16	Premier	C-2-Y
C-20	Sayers	C-3-Y
C-21	Yellow Cab	C-6-Y
D-1 to 15	Kline	E-2-Y
C-14	Gray Motors	D-2
C-13	Star	D-1
	*Courier	E-3-Y
	*Stanley	E-2-Y

New York Space	Car Name	Chicago Space
C-7	*Noma	-----
C-22	*Hatfield	-----
C-8	*Rotary Six	-----
C-11	*Crawford	C-5-Y
-----	*Climber	Q-4
A-19	Buick	C-5
A-15	Studebaker	B-2
A-11	Dodge	D-1
A-20	Chevrolet	A-6
A-14	Willys-Overland	C-3
A-16	Cadillac	D-5
A-12	Nash	C-6
A-17	Hudson	D-3
A-13	Maxwell	D-2
A-26	Hupp	C-1
A-4	Packard	A-2
A-5	Durant	A-4
A-3	Paige	B-6
A-27	Olds	D-6
A-31	Franklin	B-4
A-22	Essex	D-4
A-30	Oakland	A-1
A-23	Reo	B-5
A-21	Chandler	C-2
A-32	Lincoln	B-3
A-7	Nordyke & Marmon	F-4
A-25	Haynes	C-4
A-10	Peerless	A-3
A-8	Jordan	K-1
A-6	Wills-Saint Clair	E-2
A-2	Dort	A-5
A-24	Cleveland	F-3
A-9	Pierce-Arrow	F-1

Note: In Chicago, letter Y means Armory. In New York Show the A spaces are on first floor, B spaces on second, C on third and D on fourth.

"Not" means "not showing" or "space not available."

*Means "non-member of N. A. C. C."

Prosperity Causes Spurt in Sales of Southeast

ATLANTA, Ga., Oct. 15—Material improvement in general business and industrial conditions of the Southeast of late is resulting in an increased demand for the higher priced automobiles, Atlanta dealers and distributors advise. J. H. Somers, general manager of the Packard Enterprises of Georgia, advises that retail sales in this territory are considerably above the concern's allotment, and that sales made up to the last week in September were 80 per cent of the entire allotment for October. Other distributors of higher priced cars report a similar increase.

NEW YORK SERVICE MEN SEE FILMS

NEW YORK, Oct. 16—The October meeting of the Automotive Service Association of New York was held in the large auditorium of the Automobile Club of America and over 100 attended, this being one of the largest meetings in the history of the organization. Two films were shown, the Paige-Detroit dealer film and the "Shop Profits" film of the Automotive Equipment Association. The latter film has the Black & Decker addition. J. Howard Pile, Technical Editor of Motor World, gave a short talk on the subject of shop profits to introduce the film. After the pictures were shown short addresses were made by Alfred Reeves, General Manager of the National Automobile Chamber of Commerce; G. W. Brogan, of the Black & Decker Mfg. Co.; Ralph C. Rognon and J. Willard Lord.

Barley Company Takes Steps To Enlarge Sales Program

Seeking Widespread Distribution of New Barley Car in Addition to Roamer

KALAMAZOO, Mich., Oct. 14—William Elliott Phelps, general sales manager of the Barley Motor Car Co., builders of the Roamer and Barley six cars, is waging a strenuous campaign to get dealer representation throughout the United States and Canada. To that effect he has spent much of the time in the past two months augmenting the company's sales force.

He has been fortunate in getting several men who are widely known in the automobile industry to work directly through his department. The list, together with the territorial assignments follows:

Thomson to Represent Barley

Ralph E. Meacom, for 15 years in the industry, one-time secretary of the Bay State Automobile Association and later with Chandler-Cleveland Motor Car Co., of New England, northeast territory and upper New York state.

Cassius F. Baker, popularly known as "Cash" Baker, and recently with the National company, has resigned to join the Barley forces and is working Ohio and western Pennsylvania.

C. A. Thomson, formerly district manager for the Haynes Automobile Co., and recently of the Packard Motor Co., of Kansas City, will represent the Barley Motor Company in the northwest, traveling Wisconsin, Minnesota, Iowa, Nebraska and Kansas.

G. S. Velie, for the past five years assistant sales director with the Maxwell-Chalmers Corp., resigned to become associated with the Barley company and left Saturday for Texas, and states south of the Tennessee line.

G. L. Bennett is district manager in what is known as the metropolitan district of New York City and also has jurisdiction of sales in New Jersey and eastern Pennsylvania.

The above district managers work directly under orders from the factory. In addition the Barley company employs wholesale men in their following branches: New York, Philadelphia, Baltimore, Chicago and San Francisco.

In connection with the re-organization and expansion of his sales force, Phelps is working out an energetic advertising campaign throughout the United States.

While the present campaign deals largely with effort to secure agents and distributors for the Barley Six, Mr. Phelps declares that the output of Roamers is certain to increase in proportion and that the gross output of the plant in Kalamazoo should go up by leaps and bounds.

Report of Atlanta Reserve Bank Shows Improvement

Despite Rail Strikes, Southeast Enjoys Good Times in September and October

ATLANTA, Ga., Oct. 14—The monthly business report of the Federal Reserve Bank of Atlanta just issued shows general business and industrial conditions as a whole in the Southeast to have improved considerably during August and September in spite of the railroad strike. With the strike settled, the outlook portends unusual activity during the next several months.

Automobile sales during September succeeded in holding their own, although no improvement was noted over August. Automobile and accessory business as a whole, however, was much better than in the corresponding period in 1921, with higher priced cars in much greater demand.

Financially the district is in excellent shape, better than in two or three years. The buying power of the southeastern farmers is at least 100 per cent greater than last year. All crops yielded well and are bringing very good prices. A cotton crop in excess of 10,000,000 bales appears certain and selling at the highest prices in some years will bring southern farmers millions of dollars in profits.

Tractor and implement sales during September were considerably better than in August, and are still better the early part of October. As a whole tractor sales are more than twice as great as in the same period in 1921, and in some districts three times as great. The outlook portends normal tractor sales between now and next spring.

Better business is resulting in the organization, in all southeastern states, of several new automobile companies, and more construction of automobile buildings than at any time since the period of inflation immediately following the war.

DURANT EXHIBITS COMPLETE LINE

DETROIT, Oct. 14—The first showing of Star cars in Detroit was made this week by the Star Motor Co. of Michigan, together with Durant fours and sixes, Locomobile and the Mason light truck, the event marking the first showing of the complete Durant line anywhere. Notices issued by Durant officials call attention to the record Durant has made in the assemblage of such a complete line in eighteen months.

In connection with the showing of Stars, announcement was made of the selection of A. H. Sarver, former president of the Scripps-Booth Corp. until its discontinuance by General Motors, as president of Star Motor Co. of Michigan, which takes over the distribution of this car in this state. Sarver is also a director of Durant Motor Co. of Michigan,

which manufactures the Star and Durant four for the territory between the Adirondacks and Rockies.

"Jitney" to be Done Away With In New Eastern Firm

BRIDGEPORT, Conn., Oct. 13—The term jitney, as applied to motor vehicles engaged in public-service passenger transportation, is soon to become obsolete in Connecticut, if plans of the Connecticut Motor Stage Assn., now being organized, materialize according to expectations. That is excepting on short and isolated routes.

In the matter of making the motor stage a state-wide convenience, plans are being formulated by officers of the new organization whereby time tables are to be printed, showing times and prices, and a service established by which a person can travel throughout the state by making the proper connections on the various lines of motor stages.

Attorney and former Representative Patrick Healy of Waterbury is president of the new organization. According to his opinion, the term jitney is associated in the public mind with a "not-too-good" automobile which carries passengers for a short distance at a five-cent fare.

BARNUM IS MERCER PRESIDENT

TRENTON, N. J., Oct. 12—A change in the personnel of the Mercer Motors Co. was made at a directors' meeting by which R. W. Barnum has been made president, succeeding George P. Smith, who becomes chairman of the board. W. A. Smith, elected acting vice-president at a previous meeting, becomes the permanent vice-president and will continue as general sales manager. D. F. Fogg, formerly assistant secretary, has been elected secretary-treasurer. R. W. Barnum and W. A. Smith also have been elected directors.

CORRECT OLDSMOBILE PRICES

Due to a typographical error, the new price of the Oldsmobile eight-cylinder super-sport model was printed as \$1625 in the Sept. 28 issue of MOTOR AGE. The correct price is \$1675, reduced from \$1725. The four-cylinder sedan was omitted from the list. The new price of this model is \$1595, reduced from \$1745.

MAKES NEW SALES RECORD

SAN DIEGO, Cal., Oct. 12—Powell's Ford Headquarters claims to have established a new record for number of sales made by a Ford dealer in California in one month by selling 235 cars in September. The previous record was 206, made by a Los Angeles dealer.

CONSIDERS OVERFLOW SHOW

NEW YORK, Oct. 14—William Wellman, who has promoted several successful events in Madison Square Garden, is considering leasing the historic old building for an overflow show to be held at the same time as the national show in the Grand Central Palace.

Retail Sales in Wisconsin Continue Good in October

Rural Districts as Well as Cities Report Very Good Business

MILWAUKEE, Wis., Oct. 16—Retail business is good, considering the time of year. In the cities as well as the rural communities, dealers are selling cars every day, and if April and May were disregarded for comparative purposes, it might well be said that passenger car trade in the first half of October equalled the average of any corresponding period this year.

The higher-priced passenger cars are having their inning, for the first time in a year. This is perhaps the most striking feature noticeable in current sales. By far the greater part of sales are of enclosed cars. Several representatives of cars in the top-price classes say they have sold more limousines in the past 30 days than in all of the rest of the year put together. They take it that the moneyed people have finally decided to replace their family cars. The sale of coupes or roadsters to the heads of such families also is experiencing a stimulation.

Last spring a good many prospective buyers of medium-priced cars were wont to say, "I'll wait until Fall," in hopes of either price declines, or later models, or a better cash position. There are still some of these people who now say, "I'll wait until Spring," but these are by far in the minority, comparing the number with those who expressed this feeling six, eight and ten months ago.

Enclosed car demand ranges far above the proportions expected even by conservative dealers who admitted that the coupe and sedan were tending to outdistance the so-called open car in due time. This is the reason why some dealers remain behind on orders, although not all are able to place open cars in the hands of customers promptly on the day of sale. The active demand for sport models also runs ahead of the ability of factories and distributors to place these special-equipment types into purchasers' hands promptly.

TO TEACH AUTOMOBILE MECHANICS

SASKATOON, Sask., Oct. 14—An advanced class in motor mechanics will be offered at the University shortly by the vocational education committee, provided enrollment justifies it. It has been noticed, according to members of the committee in session at the school board offices last night, that the student body is composed partly of men who are merely beginners in motor mechanics, learning how to run their cars or taking the course more or less as a hobby, and partly of motor mechanics seeking higher knowledge.

Rail Congestion Continues to Embarrass Factories

Delays in Delivery of Materials Interfere With Production Schedules

DETROIT, Oct. 13—Under the rush of coal shipping to lake ports before the closing of navigation on the lakes and the diversion of rail equipment to the transportation of farm products from western states, service to automobile manufacturing companies in the Detroit district is approaching a point where it may be necessary to employ motor trucks for hauling material to keep factories operating. The use of trucks up to this time has been limited to the hauling of material around congested transportation centers to points where it may be loaded for delivery either by rail or boat to Detroit. Steel is being hauled out of Pittsburgh by truck to railroad yards where freight cars are available to avoid the delays experienced in getting cars in and out of the immediate Pittsburgh districts.

Rail shipments direct from Pittsburgh are requiring 10 days and upwards to make the normal three day trip to Detroit. Steel at the mills in Pittsburgh is being held for days at a time awaiting cars for loading. Steel from Ohio districts is being shipped by truck to lake ports for boat transportation to Detroit. Embargoes by railroads in the eastern districts and in some sections of the middle west and south are interfering with both deliveries and shipments to and from automobile factories. For the most part, however, these are intermittent and occasion only temporary delays.

Production schedules are being interfered with somewhat by difficulty in obtaining material and departments in some plants have been compelled to close for short periods, owing to holdups. There has been no cessation of operations in any plant, however, due to material shortages and factories will go to any limits necessary to maintain production at a point required by sales.

Traffic and purchasing departments do not look for any relief from the rail difficulties until the coal requirements of the northwest and other regions served by lakes shipping are met. This is expected to require a month or more and until that time, deliveries and shipping schedules will be upset. Driveaways are continuing to be the rule on deliveries within 1,000 miles.

SUMMONED FOR SLOW DRIVING

BOSTON, Oct. 14—A Massachusetts woman received a summons to appear before Motor Vehicle Registrar Goodwin a few days ago to explain about a violation of the motor laws on the highways. With great fear and trepidation because she never had been held up or arrested she called at Goodwin's office. She was asked if she had been driving on the road

from Newburyport to Portsmouth the previous Sunday afternoon, and she admitted that she had. She was asked how fast she was going, and replied she drove very carefully, always, generally about 15 miles per hour.

"That's just the trouble," she was told. "You were going only 12 to 15 miles an hour and you were holding up traffic. It was too slow. Next time speed up a bit, not too fast, of course, but 20 miles an hour would be better. One of our inspectors followed your car for some miles and reported you were so careful that you caused blockades."

Dealers' Committee to Help Improve Traffic Code

JACKSONVILLE, Ill., Oct. 14—The members of the Jacksonville Automobile Dealers' Assn., at their last regular meeting, varied the usual program by inviting city officials to be their guests. A banquet was served at the Dunlap hotel and Dr. R. B. Brokaw, public health officer; Frank Kiloran, chief of police, and A. G. Morgan, manager of the city railway and light company, were among the men who responded.

Chief Kiloran spoke of the traffic problems and asked for the co-operation of the dealers in devising parking rules and handling congested traffic. As a result of his suggestions, President Berger appointed a committee to consult with the chamber of commerce traffic committee to revise the code in order to reduce accidents and promote the comfort and convenience of motor car owners.

CLUB STARTS TOWING SERVICE

CANTON, O., Oct. 14—Free towing service and free mechanical first aid have been introduced by the Canton Automobile Club. Secretary Flory announced that a truck will respond to the call of a member any place within a radius of 10 miles of the club, and tow his car to any garage or destination the member desires, whether it is disabled in a collision, runs over an embankment or in whatever kind of an accident it may figure that would make it necessary to bring towing service into action.

BUS LINES DISCONTINUED

NEW YORK, Oct. 15—Supreme Court Justice Mullan, acting on the petition of Edward Schafer of Schafer Bros., bankers, has granted an injunction which will force the discontinuance of every bus line in the city operated or supervised by the municipal authorities. The injunction will leave only the Fifth Avenue bus line in operation and will affect more than 200,000 passengers. An appeal will be taken by Mayor Hylan.

STAR AT TOLEDO

TOLEDO, Oct. 17—The new Star car exhibited for the first time in Toledo this week by S. Y. Brigham Motor Sales Co., has been viewed by more than 20,000 persons.

180,000 Miles of Good Road In 20 Years, Is Federal Plan

State and Local Construction Will Provide for Equal Mileage

WASHINGTON, Oct. 14—Fifteen to 20 years of building good roads lie ahead of the United States. Under the program which the country has adopted there will be built, during that time, 10,000 miles of improved highways which will constitute the Federal-aid highway system and an equal or greater mileage of state and local roads.

Officials of the Bureau of Public Roads place the aggregate cost of the Federal-aid program alone at about \$3,000,000,000 spread over the 20 year period. They base this estimate on an average cost of \$17,000 a mile. The average cost, in turn, takes into consideration all classes of improved roadways from the cheapest to the most expensive types. Approximately one-third of the proposed system, or 60,000 miles of improved highways, already are either built or building.

The present Federal-aid road building program, officials of the bureau state, will contemplate the construction of only such roads as fit into the national program and contribute to the national system. At the same time the roads will be so selected as to serve the most important local requirements. With marked modification, the system adopted in building the railways of the country will be borne in mind in the construction of the country's new highways. There will be main lines of highway communication between centers and thousands of miles of feeder roads, reaching back into the more sparsely settled regions and into the rich agricultural sections, to tap areas whose population and products will flow over the new system.

New roads will be planned and built—thousands of miles of them—where they will fit in most advantageously with the entire program. The bureau is continuing its research work into most efficient methods of road-building, and has amassed a considerable store of valuable information all of which will be available for the highway engineer of tomorrow, whom the board is seeking to have educated in practical and modern methods.

OLDS SALES EXCEED PRODUCTION

DETROIT, Oct. 14—Olds Motor Works, as result of recent price reductions, reports business to be running in excess of production, and is compelled to distribute output on proportionate basis among distributors. Demand for cars is reported to be especially brisk on the west coast where good business is expected to develop as the resort season progresses. Two trainloads of cars will be shipped to the coast as soon as officials feel that this number can be allotted to any one section.

Organized Ohio Dealers Oppose Proposed Tax Limit

Fear Automotive Industry Would Suffer Further Assessment if Property Levies Were Reduced

COLUMBUS, O., Oct. 14—The automotive interests in Ohio are very much concerned over the proposed tax limitation amendment to the state constitution which will likely come up for ratification by the voters of the state at the November election.

The amendment provides for an actual limitation of taxes on personal and real property to 15 mills on the dollar. This, of course, excepts the bonus tax and all special levies which have been approved up to date. Since the present tax rate in many sections averages from 22 to 28 mills on the dollar, it would mean a reduction of taxes on personal and real property by fully one-third.

Thus there would be a deficiency of taxes which would have to be made up by the tax levying authorities by special taxes. Since the automotive industry has always been a prey to the taxing authorities of the Ohio legislature, it is feared that further inroads on the purses of motorists will be undertaken. It is believed that license fees would be increased, that a gasoline tax might be imposed and that other things would be done to harass the automotive industry generally.

The Ohio Automotive Trade Assn. is strongly opposed to the amendment and is urging its members to help defeat it at the polls. A campaign showing the evil effects of the amendment will be started by that organization just as soon as it is ascertained if the injunction pending to keep the proposition off the ballot is decided against those who seek to enjoin it.

4,058 BUICKS MADE IN WEEK

FLINT, Mich., Oct. 13—During the week of Sept. 23 a new high point of production was reached by the Buick company when the plants at Flint and Detroit turned out a total of 4,058 cars, which is an average for the five and one-half working days of 737 cars a day. The factory is making every effort to still further increase daily production.

TRACTORS TO PULL SNOW PLOWS

PITTSFIELD, Mass., Oct. 14—The county commissioners of Berkshire county have voted to buy three tractor snow plows at an outlay of \$20,000 to keep the main highways through the county open the coming winter.

TAKES OVER TRACTOR COMPANY

CHICAGO, Oct. 16—The Wilson Tractor Mfg. Co., Ottumwa, Ia., has been absorbed in its entirety by the Austin-Western Road Machinery Co. of Chicago. The plant at Ottumwa will continue without change in the personnel though officials at Chicago will appoint one in charge

of the factory. Sales will be handled by the Chicago firm whose principal salesrooms are at 400 N. Michigan avenue.

Factory Service Men to Meet Nov. 24 in Chicago

NEW YORK, Oct. 14—The National Automobile Chamber of Commerce has practically completed arrangements for the semi-annual convention of factory service managers. Tentative dates of Nov. 24 and 25 have been set and the place selected is Chicago. The first day of the convention will be given over to discussions and papers concerning factory service problems. The second day will be devoted entirely to the subject of service associations, a phase of service in which the Chamber has taken much interest. An invitation has been extended to all service and trade associations to send delegates. The detailed program will be completed in a week or two.

\$2,389,210 GAS TAX

HARRISBURG, Pa., Oct. 17—The sum of \$2,389,210 was received the first year of the one-cent tax on gasoline, according to announcement by Charles A. Snyder, state treasurer. The estimate at the time the 1921 legislature provided for the tax, was that it would bring in \$4,000,000 a year. Of the money collected, one-half is paid into the state's general fund, while the other half goes to the counties in which the tax originated. The tax for August, payable in September, amounted to \$294,129. The largest amount collected any month since the tax law went into effect, was Sept. 1, 1921. Of that total, there came from the city of Philadelphia \$40,025, where 4,002,500 gallons were sold in August.

CHALMERS JOINS JOYCE

DETROIT, Oct. 14—Hugh Chalmers has identified himself with Frank H. Joyce in the formation of the Joyce Manufacturing Co., which will begin operations in November as a body paint and trim company and manufacturer of tops. Chalmers is to be chairman of the board of directors and will make his executive headquarters at the plant. The active management falls to Joyce, who is president and treasurer. William M. Joyce is secretary. The company is incorporated for \$500,000 and will have capacity for 150 bodies daily.

Chalmers, since his retirement from the automobile company bearing his name, has maintained private offices in Detroit, where he continued his personal business. He is giving up these quarters to be closely in touch with the new venture.

Joyce was an original incorporator of the American Auto Trimming Co., acting as general manager and treasurer for 12 years until his recent retirement.

Dealers Frolic and Feed at First Indianapolis Outing

Hoosiers Learn What a Good Time Business Men Can Have When They Shut Up Shop

(Pictures on page 27)

INDIANAPOLIS, Oct. 13—Two hundred and fifty dealers, and their friends, shut up shop here on a recent Saturday and fraternized, played games and stuffed themselves at a clam bake done in true City Island fashion. It was the first outdoor frolic the local association ever gave and proved so good that it will undoubtedly be repeated.

John Orman, manager of the association, did himself proud. When they reached a nine mile turn in the road there were signs directing, "Sinners Turn Here." A short turn and the stage was found set for the weirdest game of base ball ever invented. Huge pillows served as bags. The bats were of swatter or cricket type, while the ball was a six inch sphere of rubber that boomeranged back over the plate when a fair ground hit was made on the bias. There were more runs than laughter, and some of the spectator fans are still sore from convulsive merriment. Capital Avenue played the Meridians a close limit game. Two umpires were run off the field, seven pitchers were displaced and many of our "prominent citizens" sent to the benches of sod.

The game was so good that but one small set of galloping domino devotees sought the shade. During and after the feed there were no speeches. Two local wits (Judge Orbison and poet Bill Herschell) told stories—and one yarn that might have been told in Sunday school lifted the lid. Trade bodies take heart. You can teach an old dog new tricks. This was the first picnic of one of the oldest trade bodies in the land. It was a scream and the members howl for more. There was no signs of business. Even the name placards gave no firm or company connection. It was John Jones, "Automobiles," "Tires" or "Accessories."

DORT STAFF INCREASED

FLINT, Mich., Oct. 14—Recent expansion in the general sales department of the Dort Motor Car Co. has added three men to the Dort organization during the last two weeks.

Sam C. Mitchell joined the Dort as assistant sales manager. He formerly was branch manager of the Cleveland Tractor Co. at St. Louis.

William Hufstader, formerly publicity and convention bureau manager of the Flint Chamber of Commerce, is another addition to the Dort sales staff.

W. Harold Kingsley, a newspaper man of wide experience, is in charge of the Dort publicity. He joined the company this week. He returned in September from Paris, where he was on the European staff of the Chicago Tribune.

CONCERNING MEN YOU KNOW

Frank H. Parker, president of the Parker Motor Truck Co., Milwaukee, and guiding head of several other large manufacturing industries, died at Columbia Hospital after a brief illness, at the age of 66 years.

Charles B. Dunbar of Milwaukee has been appointed manager of tire sales of the Milwaukee branch of the Brunswick-Balke-Collender Co., 275-279 West Water street. He formerly was branch manager of the Ajax Tire & Rubber Co. and more recently general manager of the United Consumers Corp., dealing in automotive equipment.

A. M. Harger has been appointed salesmanager of the Fink Motor Car Co., Milwaukee, distributor of the Oldsmobile in Wisconsin and Upper Michigan.

Charles Bohrman, salesmanager of the Badger State Motors Corp., Milwaukee, has resigned to become associated with the Wm. F. Sims Motor Co., Milwaukee, distributor of the Lincoln.

Monte W. Sohn, a former editor of Motor Life, has organized an agency to specialize on automotive advertising, with offices at 25 West 45th street, New York City.

Appointment of A. C. Behringer as assistant salesmanager and Arthur S. Goodall as advertising manager was announced Oct. 10 by J. F. Culver, general manager of the Dorris Motor Car Co., St. Louis.

George W. Cushing, formerly advertising manager of the Hudson Motor Car Co., has resigned from the Buffalo office of Barton, Durstine and Osborne, to join the merchandising and advertising staff of C. C. Waddingham, Detroit.

Edward J. Connelly has been appointed production manager in charge of the body divisions of the C. R. Wilson Body Co. Connelly has been chief engineer of the factory for the past two years and will continue this work.

G. G. Gardner has been awarded the Star and Durant distribution for Oshkosh and Winnebago counties in Wisconsin. Headquarters have been established at Oshkosh under the name of the Standard Motor Sales Co. Branch salesrooms will be established at Neenah and Appleton. Gardner was formerly a salesman for the Beckley-Ralston Co., Chicago, and is well known to the trade.

George Cornelius, formerly instructor in automotive electricity at Des Moines, Ia. University Institute, has entered the storage battery manufacturing business and will build a battery known as the Gordon in Des Moines.

H. K. Reinoehl has resigned as chief engineer of the Defiance Motor Truck Co., Defiance, O., remaining only as a director of the company and opening an engineering office of his own.

W. T. Jennings, late of the Jennings-Sullivan Tire & Rubber Co., East St. Louis, has been appointed distributor for Illinois and Missouri by the National Body Corp., of Cincinnati. He will open a sales agency at 502 Missouri avenue, East St. Louis.

William W. Lewis has been appointed central district manager of the Cadillac Motor Car Co.

P. A. Calkins has received a promotion in the replacement spring division of the Perfection Spring Co. He will assist the manager, P. S. DeVilbiss, in the national distribution of the company's product with headquarters in Cleveland.

The advertising department of the Cadillac Motor Car Co. has been enlarged by the addition to its staff of Frank H. Lord, formerly of New York, and J. William James, of Detroit, according to an announcement by Verne E. Burnett, advertising manager.

J. G. Murphy has been made factory manager of the Anderson Motor Co. at Rock Hill, S. C.

William R. Strickland, recently with the General Motors Research Laboratories and for a number of years chief engineer for a well-known automobile concern, has joined the engineering organization of the Cadillac Motor Car Co. as assistant chief engineer, according to an announcement by the company.

Clarence F. Williams has been elected head of the Simplex Wire Wheel Co., Cadillac, Mich., in place of John P. Wilcox, who resigned on account of the pressure of other business. Wilcox will continue with the company as director.

R. A. Brower has been appointed salesmanager for the Covey-Ballard Motor Co., Salt Lake City, distributor of the Ford and Lincoln cars, who will soon move into its new home.

James R. Findlater, vice-president and Pacific Coast manager of Earl Motors, has been compelled to take an indefinite leave of absence, to secure a much-needed rest, and regain his health, and has severed all connections with the business world.

Howard D. Graves, formerly of Taber Rodgers, Inc., Hartford, Conn., has joined the firm of Russell P. Taber, Inc., Red and Peerless distributor, and will devote his time to Peerless. He has also acquired an interest in the Taber organization.

Albert R. Coughlin, who has been connected with the sales department of the Durant Motor Co., of Michigan, since January, died last week, after an illness of two months. Before joining Durant he was a special representative of the General Motors Export Co. and previously was assistant sales manager of the Dort Motor Car Co.

sengers in these busses are entitled to the greatest available comfort and the other is that as these busses invariably travel at fairly high speed and frequently carry very heavy loads they should be so equipped as to permit of their operation with a minimum of damage to the roads upon which they travel.

Recommendations were made to the government that all commercial vehicles should be required to use pneumatic tires, but this is not considered practicable.

GOOD TRUCK SALES IN OHIO

COLUMBUS, O., Oct. 13—There is a decided improvement in the demand for commercial vehicles and motor trucks in Columbus and central Ohio territory. Dealers in all sizes of trucks report a good increase in the number of inquiries and sales and apparently the slump is now a thing of the past. This applies to all sizes, but more particularly to the light delivery wagon which is selling extremely well. The heavier trucks, those ranging from 3 to 5 tons, are also in better demand.

Survey Being Made of Electric Service Facilities of U. S.

Automotive Electric Service Association Gathers Data to Show How Work Can Be Handled

DETROIT, Oct. 14—The Automotive Electric Service Assn. is making a complete survey of the extent and resources of this branch of the automotive industry, as part of its campaign to place electrical service before the industry in its proper perspective. Questionnaires are being sent to authorized service agents of electrical equipment manufacturers from the offices of D. W. Burke, secretary of the association in Detroit, which will give the information regarded as necessary to promote the best interests of this service group.

The questionnaire lists the names of the electrical manufacturers represented; number of employees in each department and names of officers; the total investment in buildings, equipment, shop tools and fixtures, stocks of parts, and the gross volume of business in 1920 and 1921 and in 1922 approximately. The information in the individual questionnaires will be held in confidence, the summary of them all being the only feature which will be laid before manufacturers.

With the aid of this data it is proposed to lay before electrical equipment makers, and through them the car makers, the general capacity for service of the association, and to recommend that the electrical requirements of all car dealers throughout the country can be better met through the electrical service association than through the service departments of the car maker. By making use of the facilities of the association members, it will be shown that stocks of electrical parts can be greatly reduced or dispensed with in the automobile factory or car dealer's stock room.

Where car dealers are equipped to do electrical service work they can obtain their supplies as they need them from the association members, and where this equipment is not available, the association members will be prepared to both furnish parts and make necessary installations and repairs. The possibilities of this service will be especially urged as effective in smaller communities and in overcoming difficulties involved where car dealerships are subject to change.

The Automotive Electric Service Assn. now includes over 250 members and is rapidly gaining in strength. Practically all of the larger service agents are now included and it is hoped to bring in most others before the annual meeting in Chicago, Jan. 29 to 31, inclusive. This meeting will be held in the Congress Hotel during the week of the Chicago automobile show. Joint sessions will be held with the Automotive Electric Assn., and with the service managers group of this latter association.

CARS BOUGHT FOR BUSINESS

SPRINGFIELD, O., Oct. 14—Approximately 27 per cent of all sales of Westcott automobiles this year have been for strictly business uses, according to a survey prepared by E. H. Gilcrest, salesmanager of the company.

LARGE WASHINGTON SHOW

WASHINGTON, Oct. 12—Washington automobile dealers will hold their fall enclosed car salon on Oct. 21-28. More than 65 entrants have already signed up for space. Indications are that the forthcoming exhibit will be the largest in the history of the Washington Automobile Trade Association.

PNEUMATIC TIRES REQUIRED

TORONTO, Ont., Oct. 13—In the near future all motor buses operated in the Province of Ontario will be required to carry pneumatic tire equipment, according to Hon. F. C. Biggs, minister of highways. This step has been under consideration for some time and apparently definite action has been decided upon.

There are two reasons for the decision. One is the government's belief that pas-

BUSINESS NOTES

Alfred B. Brady and W. C. and L. O'Dell, all of Salisbury, N. C., have organized and incorporated the O'Dell Auto Equipment Co., with \$25,000 capital stock, to carry on a business at Salisbury as accessory and equipment dealers.

The Rudolph Jiffy Tool Co. has been organized at Eau Claire, Wis., with \$25,000 capital to manufacture a line of wrenches, spanners, valve-lifters, bushing-removers and other automotive tool specialties designed by John Rudolph of Brantwood, Wis. M. J. and H. A. Leinenkugel, former brewers of Eau Claire, are associated with Mr. Rudolph in the new enterprise.

The Gaddis Auto Parts Co. has been incorporated in Atlanta with \$10,000 capital, and has established a used car agency and a business as dealers in a full line of automobile parts.

The San Juan Auto Storage Co. was organized and incorporated this month at San Juan, Fla., with a capital of \$100,000, and in addition to operating a large garage will handle power farming machinery and automobile parts.

Howard C. Goss, manager of the White Motor Co. branch at Nashville, Tenn., advises that the White company is planning the establishment shortly, at Chattanooga, Tenn., of a branch plant for the manufacture of trucks.

The Magnetic Realty Co., 185 Mason street, Milwaukee, is building a 3-story fireproof garage, sales and service building, 60x120 ft., at 818-822 Clybourn street. It will be operated under lease, but the name of the lessee is not divulged.

The Marathon Motor Car Co., Wausau, Wis., Ford dealer, is erecting one of the largest sales and service buildings in Wisconsin, outside of Milwaukee. It will be 60x120 ft., four stories and basement, and will cost \$75,000. It will be ready Jan. 1.

The W. Frank Horn Co., Inc., Milwaukee, jobber of and dealer in automotive equipment, recently made defendant in involuntary bankruptcy proceedings, has been adjudicated bankrupt. It schedules liabilities at \$93,270 and assets at \$95,212.

The Blanchard-Wing Co. has been organized and incorporated in Atlanta with \$23,000 capital, and has established a business on Peachtree street as wholesalers, in the southeastern territory, of automobile accessories.

The Stanton Co., of Fort Pierce, Fla., manufacturers of automobile supplies and equipment, has purchased a site adjacent to its plant, 200 by 70 feet, and will this year construct an addition that will considerably enlarge the capacity.

Dan De Wine, operator of a service station at Knoxville, Tenn., is planning the construction this year of a \$30,000 plant to be used as a garage and service station exclusively. It will be located at Broadway and Lamar streets.

Net profits for the first six months of the year for the Kelly-Springfield Tire Co. are estimated to be in excess of \$1,500,000, equivalent to about \$2.15 a share on the 362,085 shares of \$25 par value common stock outstanding after note interest and preferred dividend requirements for the period. It is expected that the showing of the last six months will be equally as good, which will give \$4.30 a share for the full 12 months.

Signal Truck Corp. has opened a direct factory branch in Indianapolis, under the management of J. T. Crossland, who has served as district man-

ager for a long time. Complete sales and service equipment has been installed to care for the increased business in that territory.

American Motor Vehicle Radiator Co. of Litchfield, Ill., announced a 10 per cent increase in wages to all employees, effective Oct. 1. During the depression immediately after the late war, it became necessary to reduce wages twice and the employees accepted the cut, realizing that it was imperative if operations were to continue. With returning prosperity, the company restores a portion of the reduction. About 700 men were affected.

The Rickenbacker-Philadelphia Co., distributor of Rickenbacker cars, has purchased the Winton factory branch in this city and because distributor for the Winton Six, which it will merchandise in addition to the Rickenbacker. It has moved its sales and executive offices to the Winton headquarters, 1404 North Broad street. This is the first time the Winton has been represented in this territory by a distributor, the factory having maintained a branch here before this.

The Wear Ever Patch Co., situated at 218 E. Long street, Columbus, O., has been chartered with a capital of \$10,000 to manufacture and sell the Wear Ever tube patch.

The Columbus Auto Parts Co., 215 East Russell street, Columbus, O., has started the erection of an addition to the plant which is 75 by 260 feet, of saw tooth construction. The company manufactures various auto parts and accessories. Much new equipment is being installed.

Moon Motor Car Co. has declared a quarterly dividend of 25 cents on common stock, payable Nov. 1. It is reported that in the near future the annual dividend rate of \$1 will be increased or an extra disbursement made. Earnings for September are understood to have approximated \$400,000. Current earnings after deductions for taxes and preferred dividends are running at an annual rate of about \$9 a share on the 154,213 shares of common stock. It is expected that net profits for the entire year of 1922 will be about \$5 a share on the common.

Hupp Motor Car Corp. has declared the regular quarterly dividend of 2½ per cent on common stock, payable Nov. 1. At the annual meeting of the corporation, stock holders approved the retirement of 4,000 shares of preferred stock acquired by purchase, 1921 shares of preferred stock acquired by conversion into common shares, and 130,790 shares of common held in reserve for preferred stock conversion. The corporation's total capitalization now stands at \$6,100,000, consisting of 9079 shares of \$100 par preferred and 519,210 shares of \$10 par common.

Gardner Motors Co., St. Louis, Mo., announces the rounding out of its export organization by the following appointments: Consolidated Motors, Ltd., Winnipeg, Canada; National Auto Import Co., Mexico City, Mexico; Robertson & Malcolm, Ltd., London, Eng.; Sociedad Hispano Americano Gastonoye, Madrid, Spain; Rudolph Schmidt, Copenhagen, Denmark; W. H. Carpenter, Sidney, Australia; John Burns, Ltd., Christ Church, New Zealand.

The Paul Rubber Co., Salisbury, N. C., has equipped a new factory to build 5000 tubes a day. This is the second new tube plant built by this company since last year.

passenger car, has taken up the manufacture of taxicabs, having contracted with the Diamond Taxicab Co. of New York to produce the vehicles which this new concern will put into operation as fast as possible. It is expected that 2000 of these taxicabs will be turned out inside the next year.

HIGHWAY CONTESTS BARRED

SAN FRANCISCO, Oct. 14—No more long-distance, endurance, or any other kind of automobile racing or contests are to be allowed on the paved highways of California, according to announcement by the California State Motor Vehicle Department. In its campaign to stop such contests, inspectors of the department, late in September, arrested Wells Bennett, when he had only 100 miles to finish on non-stop run from Canada to the Mexican border.

DRIGGS COMPANY MAKES CABS

NEW YORK, Oct. 12—Driggs Ordnance & Manufacturing Corp., with a plant at New Haven, Conn., whose connection with the automobile industry has been featured by the production of the Driggs

Association Starts Teaching Importance of Caring for Cars

Publicity Department of Houston Trade Organization Campaigns to Instruct Owners

HOUSTON, Tex., Oct. 14—H. H. Goldman of the Mosehart-Keller Auto Co. was elected president of the Houston Auto Trades Association at the annual meeting last week. The association is composed of the various local associations. Vice-presidents were named from the different local associations as follows: Frank Bradley of the dealers association, first vice-president; William H. Still of the electrical division, second vice-president; T. C. Morrow of the repairmen's division, third vice-president; J. H. Glass of the tire and accessory men, fourth vice-president. J. H. Shelor was elected treasurer. The board of directors follows: R. F. Houser, E. P. Maynard, Thomas A. P. Pendarvis, W. N. Kuntz and C. W. Manford. F. W. Mozart was elected secretary manager.

In his inaugural address President Goldman said co-operation would be the keynote of the association's activities for the next year, and that that meant co-operation with each other and co-operation with the automobile owners.

One of the features of the work for the coming year will be that of the publicity department. This department, the new president said, will endeavor to tell the car owners how to care for their cars and tires. He declared it is amazing how business men will keep a \$1,000 bond in a safety vault and at the same time allow their \$1,000 car to stand in the streets in the rain unprotected, unlocked and uncared for. The association will endeavor to convince the car owners that \$1000 invested in an automobile is just as valuable as the thousand dollars invested in something else and that the automobile is entitled to care and protection if the best results are to be expected from it.

The association pledged itself to aid the officials in efforts to eradicate car thieves in South Texas and to do everything possible to give the customers the best service possible and the best to be had for their investment in automobiles.

"FORD DAY" AT DANVILLE, ILL.

DANVILLE, Ill., Oct. 13—Impressed by the great success of "Ford Day" at Bloomington recently, the Retail Merchants Association of Danville decided to arrange a similar event for this city, the date being fixed for Thursday, Oct. 19. All Ford owners of the county will be invited to attend and participate in a parade. Valuable prizes, including a new Ford car, will be given away and other plans made to attract a large number of visitors and stimulate business among the merchants as well as the automotive dealers generally.

IN THE RETAIL FIELD

The King Motor Supply Co., Milwaukee, has been incorporated with \$10,000 capital to deal in automotive equipment and supplies. The principals are A. B. Cope, 790 Wentworth avenue; J. E. Tierney and F. J. Jennings, attorneys, 425 East Water street.

S. E. Sanders, Ford dealer, Waupaca, Wis., is building an addition, 30x50 ft., to provide more adequate service facilities.

The Wisconsin Regrading Co., Sheboygan Falls and Fond du Lac, Wis., is erecting a 1-story building, 50x90 ft., in Rhinelander, Wis., for its new branch service station.

The Perfect Carbon Remover Corp., Milwaukee, has been incorporated with \$3000 capital stock by J. H. Cochrane, H. A. Robinson and G. A. Robinson to manufacture and apply means of removing carbon deposits from internal combustion engines.

The P. H. Palmer Co. has been organized and incorporated at Jacksonville, Fla., with \$50,000 capital stock, and will establish a business as automobile accessory dealers. P. H. Palmer, of Jacksonville, is president, and F. C. Day, secretary.

The Stutz Wisconsin Co., Milwaukee, distributor of the Stutz in Wisconsin, has moved to permanent quarters at 4501-4505 Grand avenue. The Wm. M. Maxwell Co., Stutz dealer in Milwaukee and vicinity, will maintain its sales and service station in the same building.

The Moon Motor Sales Co., Madison, Wis., has been organized by A. G. Brandel, C. H. Pierce and W. H. Ryde to deal in the Moon, with headquarters at 20 South Webster street. A. L. Kvanvig has been appointed sales manager.

The Fond du Lac (Wis.) Auto Painting Co. has been established by Charles Tiebing and C. H. Hamlin, expert painters, with headquarters in the Michler building.

The Nelson-Mitchell Co., 525 Jefferson street, Milwaukee, distributor of the new Mitchell in Milwaukee, has incorporated its business under the same style, with \$50,000 capital stock. John E. Nelson, principal owner, becomes president, treasurer and general manager.

The Stebbins-Dietz Motor Co., Milwaukee, Wisconsin distributor of the Rickenbacker, has taken over the entire building at Van Buren and Martin streets, of which it has occupied about 50 per cent.

Jones-Opper Auto Co., of Omaha, Neb., announces that they have received a franchise for the Dorr Motor Co. to cover Iowa and Nebraska.

Hoffman Brothers, 153 High street, Hartford, Conn., have taken on the Gray for this section of the state and report the sale of 18 cars in the first two weeks.

A number of Hartford accessory stores have taken on radio equipment as a side line. The A. Olafsson Motor Supply Co., at 347 Trumbull street, was one of the first to do this and is making good.

The Paige-Jewett Sales Co., Lorain, O., has been incorporated with a capital of \$15,000 to deal in cars and accessories.

The Motolock Co., Cleveland, O., has been chartered with a capital of \$20,000 to manufacture and sell auto locks and other accessories.

Phelps & Co., Hartford, Conn., have acquired the salesroom at 344 Pearl street formerly occupied by the Charter Oak Motor Car Co. and use it for the display of Hudson and Essex cars.

The Harry L. Olive Co., of Spokane, Wash., a stock corporation, is being formed by Harry L. Olive to take over the Willys-Knight and Overland lines of automobiles. The headquarters will be at Olive's old stand, W1229 First avenue, which is being prepared for the new line.

B. E. Gregory, of Okanogan, Wash., has purchased the Middleton garage at Omak and has put L. J. Jones in charge as manager. The garage will be operated under the name of the

Gregory Motor Co. The purchase includes the building, equipment and stock.

R. P. Galbraith of the Galbraith Motor Co., Rock Island, Ill., has been notified that his company has been appointed agents for the Oldsmobile line in Rock Island, Mercer and Henry counties, Illinois, and Scott county, Iowa.

The Hatch Motors Co., Philadelphia, distributors for the Marmon car, has completed moving its general offices and salesrooms to Twenty-third and Walnut streets, where, pending the construction of its new building, it will display its cars.

Completing their thirteenth year in the automobile business and among pioneer dealers in Peoria, Ill., Mackemer Motor Co. has passed the 15,000-sales mark. The company handles Ford and Lincoln cars in this territory and maintains branches in Galesburg and Canton. Peoria city sales this year have reached 1300.

Fourteen Cadillac distributors from the middle west were guests of C. A. Morris of the Morris Motor Car Co., Waterloo, Ia., at the annual reunion last week. Jay Dunivan of the Cadillac sales department, and L. B. Southerland, manager of the Chicago branch, were met at the station by Morris in a Cadillac of 1903 vintage and headed a procession through the city.

O. J. Holland, proprietor of Holland's sales-rooms and garage, at Springfield, O., and agent for the Peerless and Oldsmobile, has closed a new lease on his present location at 350-358 South Fountain avenue. He has been occupying his building for the past six years.

Much attention has been attracted to the sales rooms of Circle and Boogheir in Washington Place, Springfield, O., by the showing of the new Durant Star cars. The models displayed are roadster, touring, coupe and five-passenger phaeton. Circle and Boogheir are distributors for the Durant cars in this vicinity.

Stewart Motor Car Co., Ogden, Utah, has secured the agency for the new Star car.

The Cole McVey Motor Co., Warren, O., has been chartered with a capital of \$30,000 to deal in cars and accessories.

The Wellsville Motor Co., of Wellsville, O., has been incorporated with a capital of \$10,000, to sell motor cars.

Fletcher Motor Sales Co. has been organized at East St. Louis, Ill., by Harry Fletcher and a new sales agency opened at 500 Missouri avenue. The new firm will distribute the Star and Durant cars.

The Texas Chevrolet Co. has lined up a strong organization for handling its cars in the Dallas district. Under the new arrangements the Chevrolet will be handled by the Rose Motor Co., distributor of the Chandler, and Superior Chevrolet Co., headed by Ray Sheldon and W. M. Perry, both experienced automobile men. It was announced at both service stations that all repair work will be done on a flat rate basis.

Announcement recently that the Motor Sales Corp. of Birmingham, Ala., has acquired the Hupmobile franchise came as a surprise to the initiated along Automobile Row.

The Earl car was introduced to the people of Alabama for the first time at the Alabama State Fair in Birmingham. An attractive booth was arranged by Tunstall Byars, state agent for the car, and all models put out by the Earl Corp. were shown.

Alabama people saw the Star car, latest production of the Durant Co., for the first time at the Alabama State Fair. A special booth exhibiting only Stars was arranged by the Star Motor Co. of Alabama, subsidiary company of the Whittley McDonald Co.

The new Nash agency home at Salt Lake City will be at 43 to 53 W. 4th South street. The agency is now held by the L. O. Naylor Co., recently formed.

"SHOP PROFITS" AT DECATUR, ILL.

DECATUR, Ill., Oct. 14—The Decatur Automotive Dealers Association arranged a banquet for Monday evening, Oct. 9, that proved to be one of the most successful gatherings of the year. Dealers from six adjacent counties were invited to attend and a large number responded. E. C. O'Donnell, of Chicago, gave a talk, accompanying a moving picture, arranged by Ray Sherman, illustrating "Shop Profits." At the banquet, Robert E. Lee, of St. Louis, was toastmaster and

called upon a number of dealers for talks in relation to the automotive industry in central Illinois.

TIME PAYMENT PURCHASER SUES

SALT LAKE CITY, Utah, Oct. 14—The Ogden Motor Car Co., Ogden, has been sued for \$10,000 by a customer who says he was falsely imprisoned on a charge of embezzlement which grew out of his failing to meet payments on an automobile purchased on the time payment plan. The court dismissed the charge.

Trade Association Explains Used Car Plan in Pennsylvania

Philadelphia Dealers Send Representatives to Other Cities in State

PHILADELPHIA, Oct. 14—Representatives of the National Automobile Dealers' Assn. were in this city last week conferring with Charles C. Bulkeley, secretary of the Salesmanagers' Division of the Philadelphia Automobile Trade Assn., on the aim and objects of the new organization. It was explained to the visitors that one of the first functions that the salesmanagers' division contemplates is strict co-operation with the Automobile Trade Assn.'s used car plans.

At a meeting of the Salesmanagers' Division, which included the representatives of about half the dealers in the city, it was decided to compile complete records of all employees of dealers represented in the division and to keep these records on file at the office of the trade association for any dealer desiring information regarding an applicant for employment. A questionnaire will be sent out immediately to the dealers, asking for this information, showing what position the employee holds, how long he has been with them, and any other data concerning him. This information also will be filed in the bureau.

A representative of the salesmanagers last week addressed the Wilmington Automobile Dealers' Trade Assn., explaining the used car plan and the objects of the salesmanagers' division. A delegation from the Wilmington dealers' association will visit the Philadelphia salesmanagers' division on Oct. 16. Plans also are under way for a representative of the Philadelphia Automobile Trade Assn. to visit the automobile trade associations throughout the state to enlist their interest and support in the used car plan so that it may be made 100 per cent operative throughout the Philadelphia territory.

BIG TRACTOR SALES PLANNED

CHARLES CITY, Ia., Oct. 13—The supervisory sales force of the Hart-Parr Co., tractor manufacturer, from all parts of the United States and Canada, has just completed its fall sales conference at the factory here. Plans were made for an extensive sales campaign. It was stated that the extensive sales and advertising campaign started last June had been successful and that on Oct. 1 the factory was behind with deliveries. A number of improvements are being made at the factory, the foundry and machine shop building which are receiving new tile fronts.

35 PER CENT ENCLOSED DODGES

DETROIT, Oct. 12—Dodge Bros. will devote approximately 35 per cent of its production in the latter months of this year to enclosed car production. This compares with 13 per cent last year.

The READERS' CLEARINGHOUSE

Questions & Answers on Dealers' Problems

Fire Regulations In Illinois

In regard to stove in garage in state of Illinois, have had one for a number of years and during the summer was ordered to take it out. Is there a law to that effect?—Perry Bros., Hebron, Ill.

Heating a garage by stove is of itself no offense, or violation of law. But, as it may increase the fire hazard, the Department of Trade and Commerce are empowered by the statute, section 114, Chapter 73, Illinois Revised Statutes, through the state fire marshal and his inspectors, to inspect and examine any building or other structure which is so situated as to endanger persons or property "by reason of faulty construction, age, lack of proper repair, or any other cause to become especially liable to fire," and if such a dangerous condition or fire hazard is found to exist, the dangerous condition shall be ordered removed or remedied, service of the notice upon the owner being either in person or by registered mail.

Now where an owner has received such a notice to remove or remedy the dangerous condition as alleged, such owner may appeal from such orders of officers of cities, villages and towns, or from orders of deputies of the Department of Trade and Commerce, to the Department of Trade and Commerce. It is then the duty of the department to investigate, and it shall then either sustain or revoke the order. If the order is sustained, or if no appeal is made to the department, it is the owner's or occupant's duty to comply with the order.

If an owner or occupant desires further to contest the order sustained against him he may, within 10 days thereafter, appeal from the Department of Trade and Commerce to the County Court of the county in which the property affected by the order is located, for the purpose of having the reasonableness or lawfulness of the order inquired into and determined.

Upon the trial of the appeal, the court shall hear evidence as to the condition of the property in question and shall enter judgment either affirming or setting aside the order of the department, or the court may modify the order of the department.

If one does not appeal within the 10 day period fixed, he will be deemed to have waived the right to have the reasonableness or lawfulness of the order reviewed by a court and there shall be no trial of that issue in any court in which suit may be instituted for the penalty for failure to comply with the order.

Wilful failure, neglect or refusal to

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

Readers' names will not be published with articles, if a request to this effect is received with the letter. The name and address should be given, however, so that we can send a copy of our answer direct by letter. This saves waiting for the answer to be published, which sometimes occurs several weeks later, depending upon the space available.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegam.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

comply with an order of the department or other officials after same has become final is a misdemeanor punishable by a fine of not less than \$10 nor more than \$50, and in the event of a continuance of such wilful failure, neglect, or refusal to comply with the order, each day's continuance is a separate offense.

These rules apply to all garages or other buildings and were enacted to prevent fires and the loss of life. However, the facts in any particular case must determine whether any order to remedy or remove an alleged hazardous condition is reasonable.

If the time for appeal has elapsed you have slept on your own rights. However, the department should not desire to work a hardship upon an owner and might not enforce an order where it is plainly unreasonable and injurious to one's business. Otherwise, you must either appeal and get the order against you revoked or modified or comply with same.

Eliminating Hum from Generator

Q—One of our customers has an Oldsmobile Six 1918 Model, which has an awful humming sound, which seems to come from the generator. The faster the engine runs, the louder the noise becomes. When the generator is shorted, the noise stops, and when the charging rate is reduced to 10 or 12 amperes, the noise is reduced. Several mechanics have tried to correct the trouble but without success. Would like suggestions as to possible remedy for this condition.—A Subscriber, Van Wert, Ohio.

If the subscriber from Van Wert, Ohio, would give his name it would make it possible to give what information is available directly by letter, so that it would not be necessary to wait for publication in the magazine, which is sometimes delayed several weeks. Where the name is available, this is always done in addition to publishing the article, and if requested, the subscriber's name will not be published.

True magnetic hum in a generator, when bearings, gears and other details are O. K., is a difficult thing to eliminate. It is sometimes possible to reduce the amount of it by beveling or chamfering the pole pieces on the edge where the armature leaves. Again a variation in the air gap such as might be caused by turning a bit from the armature may give a magnetic hum.

Loose pole pieces, or pole pieces under which a speck of dirt is trapped may cause this humming sound, and it is a case of cut and try to overcome conditions of this kind. We have seen cases in a factory where a man might work all day trying to correct this condition, also a case where two machines were giving this trouble, and by swapping armatures, the trouble was eliminated in both.

In this particular case, it is possible that the trouble is due to some other condition such as worn bearings, which allow the armature to be pulled nearer to one pole piece than it is to the others. This condition can be checked by having the generator off of the car, and with the brushes removed from the commutator send battery current through the field only, while turning the armature by hand. With no current in the field, the armature will turn easily.

If as current starts to flow, due to connecting a battery, the armature should suddenly start to turn very hard, it would show that the armature is not in the center, and is nearer to one pole than to the others. If the armature is rubbing the poles, it can also be detected in this manner.

From your description of the car, we
(Continued on next page)

A Well Arranged Ford Sales, Service and Storage Building

Q—We would appreciate any suggestions you might see fit to make regarding suggested arrangement of the following type garage. The excavating being completed and footings in for a 100 x 100 ft. building on the lot we have in view. This garage is to house a Ford agency handling both sales and service, doing a general garage business and catering to all type car storage. In a town of 6,000 population. The lot is a 100 x 100 ft. corner lot. The front of the building is to face east and south with 16 ft. alley to the north. Access to building can be had from east, south and north. We wish to thank you for any suggested arrangement you may offer.—J. A. Cary, Cherokee, Iowa.

No doubt, you are desirous of having a driveway through your garage from one street to the other but in the first place these long passages take up a great deal of space and in the second, they divide the floor and make it almost impossible to retain any privacy in the service department. With a good wide alley as an outlet for the storage garage a side entrance might well be dispensed with.

It is considered best by many to separate the storage garage completely from the shop in order to keep storage customers from making a convenience of the shop, the men and the tools. Storage customers and especially chauffeurs, can kill a goodly amount of a mechanic's time without meaning to do it, distracting his attention so that he makes mistakes or forgets to do things which may cause trouble later. All the time that is wasted piles up the expense on another man's job and he becomes a dissatisfied customer.

Everything seems to favor the division of this building into storage on the one side and sales and service on the other, consequently, we have laid out this building with this idea in mind. The side street gives the best kind of access

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

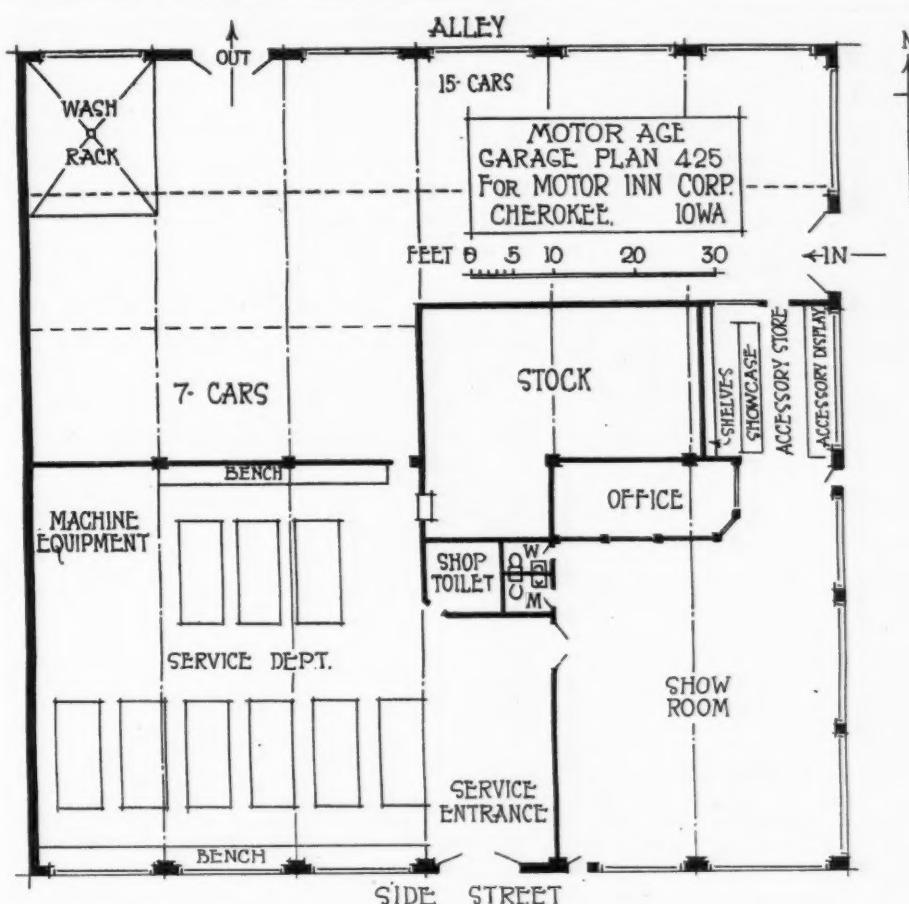
What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



to the service station; the accessory store is in full view and convenient to tourist and other storage customers, the combination stockroom is handy to the shop and to the accessory store. The

showroom is large and the office conveniently located, in fact, it could be connected up to the accessory store if desired so that the office force could help out at times.

(Continued from preceding page)
believe it is a type where the generator is gear driven at one side of the engine, from the timing gears at the front of the engine. If this is the case, it is possible that the gears are worn and cause the noise.

Elimination of the noise by shorting the generator would be possible under any of the above circumstances, as it kills magnetic action, and the machine runs like a flywheel putting no load on either the bearings or gears.

SYSTEMATIC TESTING LOCATES THE TROUBLE

Q—We wrote you some time ago in regard to a starter that worked but at the same time the lights refused to work and the engine would die when switched on battery, the ammeter showing no charge or discharge. In accordance with your suggestion, we tried flashing wires from various parts of the circuit to ground and when we got to the ammeter found that we could get a flash at one ammeter terminal but not at the other. We put on a

different ammeter and found that the trouble was eliminated.

We recently had an interesting experience with hot wires on a car. We were removing the transmission cover and accidentally got the small wire from the starter switch pinched between the transmission cover and the frame of the car, so that the insulation was chopped off. We certainly had a bunch of fireworks for quite a time and, although we played a stream of pyrene on the fire, it appeared to have no effect until the wire burned in two. Either we were too late with the chemical or the chemical had no effect.—Charles M. Saylor, Columbus, O.

We are very much interested to know that the suggestions sent enabled you to overcome the difficulty with the lights and ignition. In regard to the use of pyrene, would say that you should first have taken a pair of pliers and jerked the wire loose, as pyrene will put out a flame due to some material burning in the air but in this case the burning was due to electric current flowing through the copper and the rate of flow was such that it kept the wire red hot. Surround-

ing the wire with the pyrene gas would not stop the current flowing and accordingly, did not have any effect until the wire had burned in two.

WIRE SIZE IN SECONDARY WINDING

Q—Advise how many turns of wire are used on a the secondary winding of a Ford coil, also on the secondary of the Connecticut coil, and what size wire should be used.—Douglas Morris, Heber Springs, Ark.

We have no exact information on the number of turns or size of wire but wish to state that, in ignition coils, the number of turns of wire varies from 10,000 to 20,000 and the size of wire from No. 34 to No. 40. If you wish to find out what size wire is used on some coil that is being junked you can cut it open and measure the wire with micrometers. No. 34 wire has a diameter of .006305. No. 36 wire has a diameter of .0050. No. 38 wire has a diameter of .003965, while No. 40 wire has a diameter of .003145.

Locating Coil Wiring Defect Due to Short Circuit

Q—We would like information as to the nature of a defect in the wiring of a coil of a Hupmobile model K, using Atwater-Kent ignition, type H. In order to make the engine run we have to remove the ground connection from the coil and in its place put the high tension wire from center of the distributor, no connection being made to the large insulated terminal on the coil box. With this connection the car runs all right, but with the regular connections it will not operate. Would wrong connections on the other terminals of the coil box be a possible

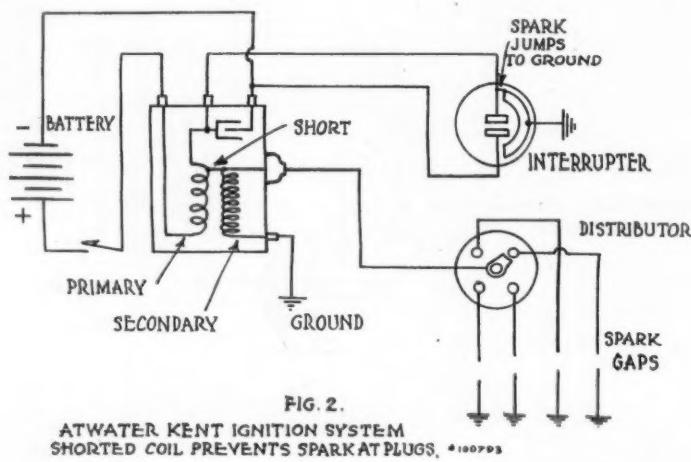
There is another kind of short circuit encountered occasionally which seems to be the kind you are experiencing. This is due to the spark jumping inside of the coil box from the secondary to the primary and then finding a weak spot in the primary installation through which it can jump to ground. We ordinarily consider on this diagram that the primary and secondary windings are separate layers. These little local currents inside

terminal without jumping the gap at the plug and as the short circuit path is of lower resistance than the air gap in the spark plug it of course takes the easiest path.

We will now refer to Fig. 3 which shows the general way in which you have made the coil operate by connecting the center of the distributor to the ground terminal and having no wire at all on the regular high tension terminal. We are using the secondary winding just backwards and will figure that the current goes from the ground terminal to the center of the distributor and then across the spark gap to ground and back to the casting or housing of the interrupter at which point it finds a chance to jump to one of the interrupter contacts and goes back through one of the wires to the primary winding where the short circuit completes the connection to the upper end of the secondary.

We do not believe that this condition is due to any misplacing of the wires on the other terminals of the coil box as this would prevent obtaining a voltage and could therefore not be the cause of the trouble. The cause may be the use of excessively large gaps in the spark plugs or the coil may have broken down merely due to long usage much as a spring, although good in the first place, will eventually break if subject to enough road shocks.

In regard to the question as to the hardship worked on the coil, would say that this method of using the coil usually puts a heavy strain on the insulation. This is due to the fact that the primary winding is first wound around the iron core and then a layer of insulation is used and the secondary is wound on top



cause for this trouble, and in using this connection is it any particular handicap to the coil.—Joseph A. Caffee, Rushville, Ind.

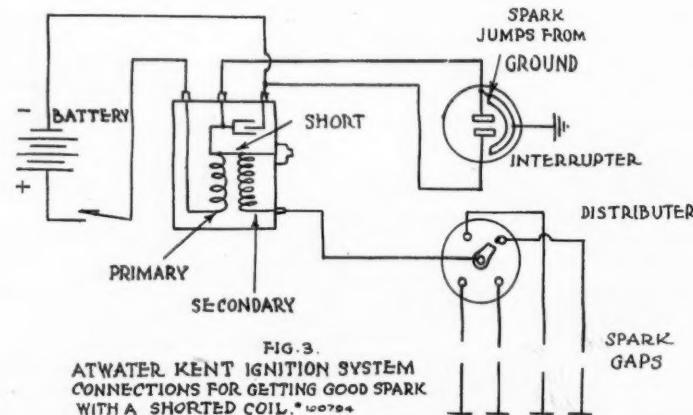
We are not absolutely sure as to the exact type of Atwater-Kent coil that you have on the car but we are showing in Figs. 1, 2 and 3 a type of coil which is similar and which will explain the condition on your car. In Fig. 1 the circuits are shown as they should be, the primary or battery circuit being from positive battery through the switch and the primary winding to the center terminal of the coil. From this point the circuit is from the top interrupter contact then to the lower one and back to the condenser connection at the coil and then back to negative battery.

The opening of the interrupter contacts gives a very sudden demagnetizing action in the coil which produces a secondary voltage. The path of the secondary current is then from the insulated or upper terminal out to the distributor, across the gap inside the distributor and across one of the spark plug gaps to ground or the frame of the car, then back to the ground terminal of the coil.

It will be noticed that the secondary circuit and primary circuits are separate from each other there being no connection. Defects in the coil due to shorts are of two kinds. In one kind of short circuit the paper in the secondary winding is punctured and small sparks jump from one layer of the secondary to other being and consequently prevent sparks at the spark plugs.

of the secondary prevent the voltage rising in the primary circuit is insulated but we must remember that this insulation is designed for 6 volts only and will not stand the 5000 volts generated by the secondary.

It accordingly happens that, if a short circuit occurs between the secondary and primary as shown in Fig. 2, the current will not go to the distributor and spark plugs but will go to the primary and then find some place, such as is inside the coil box, to ground. In this manner the secondary current can find its way from the insulated terminal back to the ground



dicated at the interrupter, where the spark can jump to the interrupter housing which being a casting is grounded

of the primary and not along side as indicated in the diagram.

It is customary to use the inner end

of the secondary as the grounded end so that there will not be a great difference of voltage between the secondary and primary. In reversing the connection of the secondary and having the outer end

stand up depends on the kind of insulation used and various factors which are difficult to determine.

As far as the strain imposed by the additional gap in the circuit is concerned,

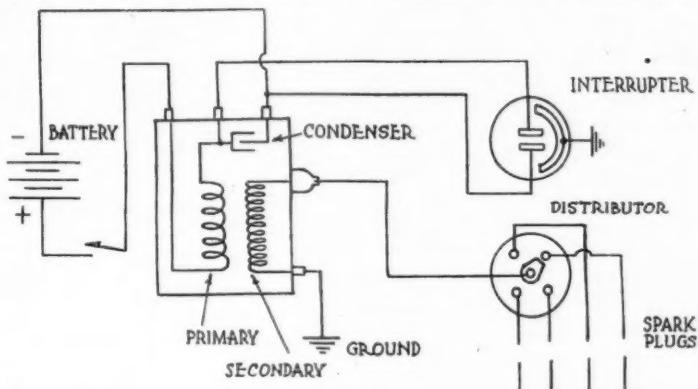


FIG. 1
ATWATER KENT IGNITION SYSTEM WORKING PROPERTY. #100792

grounded the inner end is accordingly the live end, there being a difference of about 5000 volts. There would accordingly be a rather heavy strain on the insulation separating the secondary and primary and just how long this will

would say that this does not amount to much and personally we feel that it would be worth while to use the coil just as it is, unless trouble develops, although if a long trip is contemplated it would be well to have a spare coil on hand.

No Compression Gasket Used Under Curtiss Engine Cylinders

Q—Some time ago I purchased of the Air Service Dept., a Curtiss OX 5 engine. These engines were brought to my attention through an advertisement in MOTOR AGE. As no doubt many of your readers purchased these engines I would like to have a little information given through the Clearing House Department.

Does the Berling magneto used in this engine have an impulse starter incorporated in its make up or will it produce an efficient spark when the engine is placed upon compression and then released?

1—The Berling magneto as used on the Curtiss OX 5 engine did not include a starter coupling in its construction. It is necessary to spin the propeller in order to start this engine, however, the American Bosch Magneto Company supply a coil known as the VD coil which enables the engine to be started on compression.

2—What is the compression of the Curtiss OX 5?

2—The compression of the Curtiss OX 5 engine is in the neighborhood of 75 to 85 pounds.

3—I understand an aluminum plate was used between the cylinders and the crankcase to lower the compression. This engine has no such plates. Would they be necessary when using this engine in a car chassis? The car to be used for regular work.

3—There were no aluminum plates used between the cylinders and the crankcase on the Curtiss engine at any time and the compression ratio is low enough that no trouble will be experienced with pre-ignition when used on an automobile chassis.

4—Should the valve timing be changed, if so give instructions?

4—The valve timing should not be changed, although it is advisable to set

the magneto so that the spark will occur approximately at upper dead center on the retarded spark position. The setting of the instrument used for aviation work was 28 degs. at full advance.

5—Where can parts be obtained as the package containing this engine was broken into while enroute and all removable parts were missing on arrival?

5—Parts for this engine can be obtained from the Curtiss Airplane & Motor Corp., Garden City, L. I., New York.

6—What would be the probable car speed using this engine and a Cadillac four chassis with two speed rear axle?

6—The car speed would depend on the gear ratio, which we believe on the Cad-

illac four was about 2½ to 1, if this could be reduced to 2 or 2¼ to 1 a speed of close to 100 m.p.h. could be obtained. With a 2½ to 1 the car should show better than 70 m.p.h. at an engine speed of about 1700.

7—Would any of the standard makes of 6-volt starting motors crank this engine? W. W. Bissell, Zearing, Iowa.

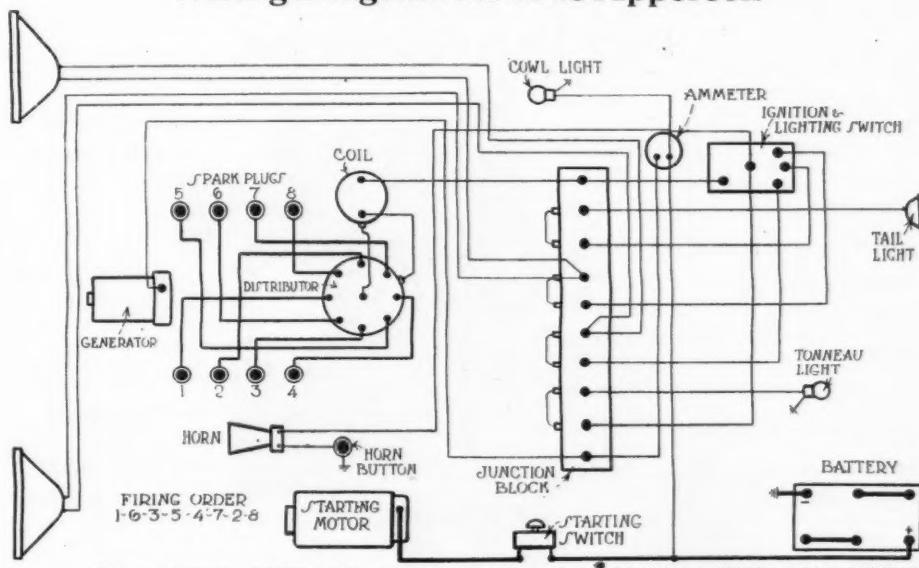
7—The standard 6-volt starting motors do not have sufficient torque to turn over the Curtiss OX engine fast enough for single magneto ignition. If battery ignition is used however, or if magneto ignition is used with the starter coil any 6-volt starting motor that will turn the engine will be sufficient. We have seen one installation of the Curtiss OX using a standard Ford 6-volt starting motor. The recommended 6-volt equipment is the large size Westinghouse frame No. 780 such as used on the Locomobile and Pierce-Arrow.

WHY LIGHTS FLARE UP WHEN ENGINE IS SPEEDED

Q—We have a 1922 Dodge roadster on which the lights flare up brightly when the motor is speeded up. The voltage and hydrometer tests are all right. Connections are all good and brushes clean. Advise the cause of this condition.—Horton Motor Car Co., Macon, Miss.

A certain amount of variation in the lights is unavoidable with the battery in good condition. When the starting motor is used it will pull the battery voltage down to 12 volts, or perhaps a little under, and the lights will accordingly not be very bright. The same battery will come up to a voltage of 15 very shortly after the engine starts and the generator begins to send current through the battery. From this you can see that even with normal operation you will get a 25 per cent variation in voltage and accordingly a variation in the intensity of the lights.

Wiring Diagram for 1918 Apperson



1918-1919-1920 APPERSON 8-18A 8-19, 8-20 BIJUR STARTING & LIGHTING & REMY IGNITION

Q—Publish a wiring diagram for a 1918 Apperson 8 cyl. car using Bijur ignition.—Frank Dierkes, Chicago, Ill.

1—The Apperson car referred to has

Remy ignition, although the generator and starting motor were made by the Bijur Co. The diagram requested is shown below.

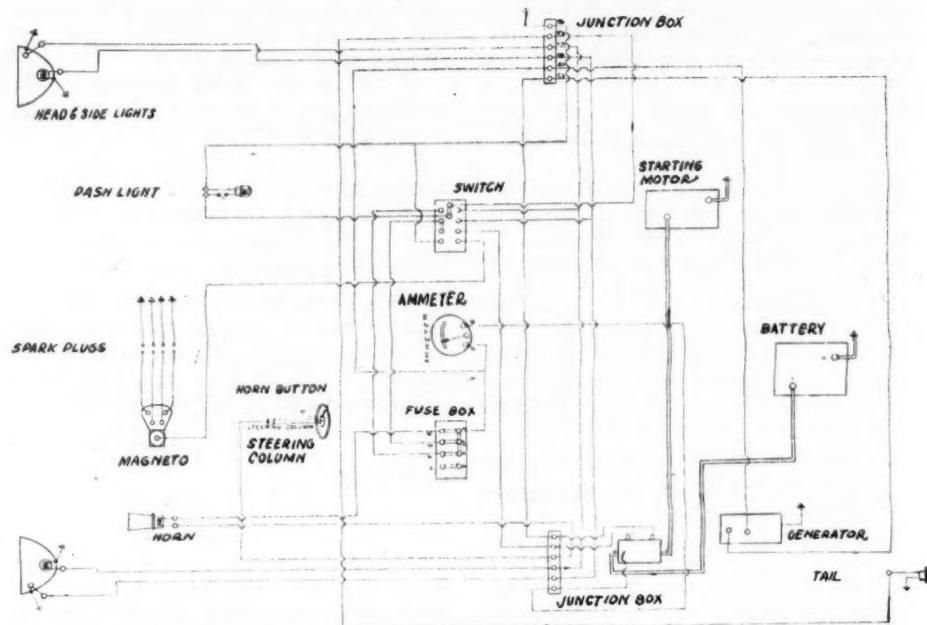
Mercer Electric System

Q—Furnish cut of electric system Mercer roadster, 22-72.—T. B. Morris, care of Kelso Motor Co., Madisonville, Tenn.

1—The two-unit Westinghouse starting and lighting system used on the Mercer series 5 is shown at the right.

2—How do you hook the speedometer on this model? This outfit looks as if it had been driven from the driveshaft by a belt to a pulley on side of frame on which the speedometer chain is connected.

2—The Mercer speedometer is belt driven from the drive shaft to a pulley as you have observed. If you will secure the proper gear or pulley ratios and the leather belt for these pulleys, the installation will be complete. We might inform you that there are three different pulleys used for the three different gear ratios used on the Mercer, and would suggest that, when you order, you mention the gear ratio contained in the rear axle of your particular car. The three standard gear ratios used in the 1921 or series 5 Mercer was 3.87 to 1, 4.14 to 1 and 3.62 to 1.



MERCER WESTINGHOUSE AND EISEMANN IGNITION SYSTEM. #100814

TESTING FORD STARTER

Q—Publish correct methods of testing out Ford starter, Ford generator and Buick starter and generator on a Model E. 44, using current from a storage battery or 110-volt line. The Ford starter operates at a high rate of speed when off the car but will not pull the engine when installed on the car. On Buick model E. 44 the starter worked before bearings were tightened up in the engine.

After the engine had been overhauled the car was towed to get it started and the engine was run for quite a period of time. The starter was then tried but would not crank the engine so the car was again towed and the engine run in until it was easy to crank. The starter was again tried but still would not crank the engine. When the engine runs slowly, with the lights turned on, the lights flicker somewhat. Inspection was made at the battery for poor connections and a new battery was tried but this did not help any. New brushes were installed,

and commutator cleaned, but the starter does not work right and the lights still flicker.—A Reader, Joliet, Ill.

1—We believe that you should do well to thoroughly study the article on trouble shooting on motors and generators, as given on page 22 of the Aug. 24 issue of MOTOR AGE. The diagram at the bottom of this page shows the voltmeter test which, if carefully made, will locate any starter motor trouble. From your description we are of the opinion that the trouble may be at the ground connection where the battery is connected to the frame of the car, although on a Ford car it might be possible that the battery carrier itself is not making a good connection with the frame of the car. A voltmeter test, however, made across the various contacts in the starter circuit,

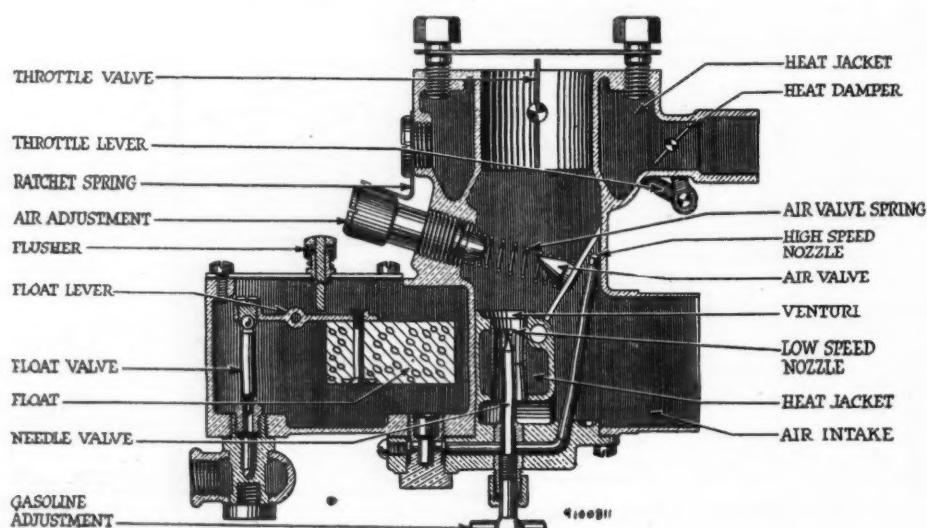
will certainly show up trouble of this nature.

There is also another possibility of trouble on the Ford, although it is a very rare occurrence. That is poorly soldered connections at the commutator of the starting motor. Accordingly, if you get a good voltage at both the battery and the starting motor but the motor does not seem to have any pull, it would be well to try a new armature. Flickering of the lights also points to a poor connection which would not be corrected by changing the battery if the connection should be at the ground on the frame of the car.

In regard to the Buick trouble, I believe that this is similar and, while we have no record of a Buick model E. 44, believe you will have no trouble in finding the difficulty if you will follow the article in question carefully. Buick cars are practically all laid out in similar manner with one side of the battery grounded and the other side connected to a large terminal on the motor generator. The usual method of operation is to have the starting mechanism drop a brush onto the starting commutator and it might be well to inspect the operation of the starting mechanism to see that the brush is allowed to drop down and make good contact with the commutator.

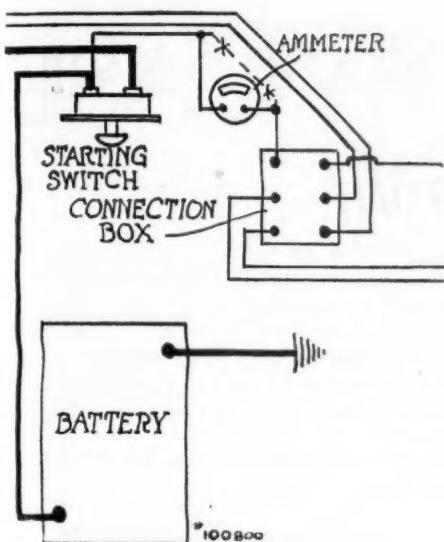
If you do not have a voltmeter for making these tests you may be able to locate the trouble by roughly checking the action of the lights when the starting pedal is operated, as a corroded ground connection practically always puts the lights out when the starting button is pressed. Another way to locate the actual position of the trouble, in case it is a poor connection, is to hold the starting pedal down for a short while and then feel the different connections to see if any of them are hot as a high resistance due to poor connection causes considerable heat.

Buick Marvel Carburetor



Q—Furnish us with the cut of a Marvel carburetor as used on Buick 6. 1918.—Norris Garage, Norris, Mont.

1—A sectional view of the Buick Marvel carburetor used on the 1918 series Buick is shown in Fig. —.



INSTALLATION OF AMMETER CHANDLER 1918 SERIES

Q—Publish instruction for attaching an ammeter on a 1918 Chandler Six using an Auto-Lite electric system.—Fred A. Buess, Kempton, Ill.

As the Chandler was never equipped with an Auto-Lite starter or generator we are therefore unable to furnish the diagram showing the installation of an ammeter on such a system. However, we are printing at the left, diagram showing installation of an ammeter on the 1918 Chandler which was equipped with the Gray & Davis starting and lighting system. If there is an Auto-Lite starter on the 1918 Chandler it is a special installation and is not factory equipment. If you will inform us of the frame number of the starter and generator we will be glad to supply you a diagram which will enable you to install an ammeter.

MAKING A GROWLER

Q—We have the frame of an old Auto-Lite generator that we wish to wind up as a growler for testing armatures and we would like to know what size wire to use and how much would be required. The frame of this generator is made of laminated iron and the size is as shown in the enclosed sketch.—Isenberg & Swanson, Lafayette, Minn.

Under ordinary circumstances it does not pay to try to make a growler due to the difficulty of getting laminations of the right size. However, having a framework which is suitable it will, no doubt, be possible to put on a winding which will give satisfaction.

In Fig. 1 we have reproduced the sketch sent us and have also added a circle to represent an armature being tested and a portion to represent the winding. In figure 2 we have shown, instead of an end view, a side sectional view which gives the dimensions of the coil that should be suitable. In figuring on this coil we first determined the amount of space available, which is determined by the circle which represents the smallest armature that will be used, as the armature must not extend down

far enough to touch the winding. As shown in the sketch this leaves about 1 inch for winding space and with the insulating washers and insulating paper gives a side distance of about 1 15/16 inches.

Referring now to fig. 2 we will consider the average length turn or as it is commonly known the mean length turn for the winding. This will neither be the outside distance around the coil or the inside but will be an average and can be obtained by adding the dimensions as 6 3/8, 4 1/4, 1 5/16 and 3 5/16 inches which gives 15 3/8 inches as the average

length turn or mean length turn of the winding. We will now take a guess at the wire size and assume it is No. 20 and from wiring tables for double cotton cover wire we find that we can put 24 turns in each inch of space. We can accordingly use 24 times 46 turns or approximately 1100 turns of wire. The Fig. 46 is the number of turns of wire which will go in the 1 15/16 inch space. From the mean length turn which is 15 3/8 inches we find that multiplying by 1100 and dividing by 12 that we have a length of wire of 1412 ft. and again referring to wiring tables we find this has a resistance of 14.3 ohms.

On direct current we would divide 110 volts by this resistance of 14.3 and we get 7.7 as the amperes which would flow but as alternating current will be used for the growler the current will be considerably reduced and it may not be enough to give good action on the growler. The exact reduction in current is something that we are unable to give definitely as it involves long alternating current calculation.

We believe, however, that a larger size wire could safely be used and have accordingly figured out the winding for No. 18 wire and in similar manner have found that the current would be approximately 17.3 amperes from a direct current standpoint. As this would be considerably reduced, due to the fact that alternating current is used, we believe that with a 15 amperes fuse the growler would operate O. K. with about 5 pounds of No. 18 wire used.

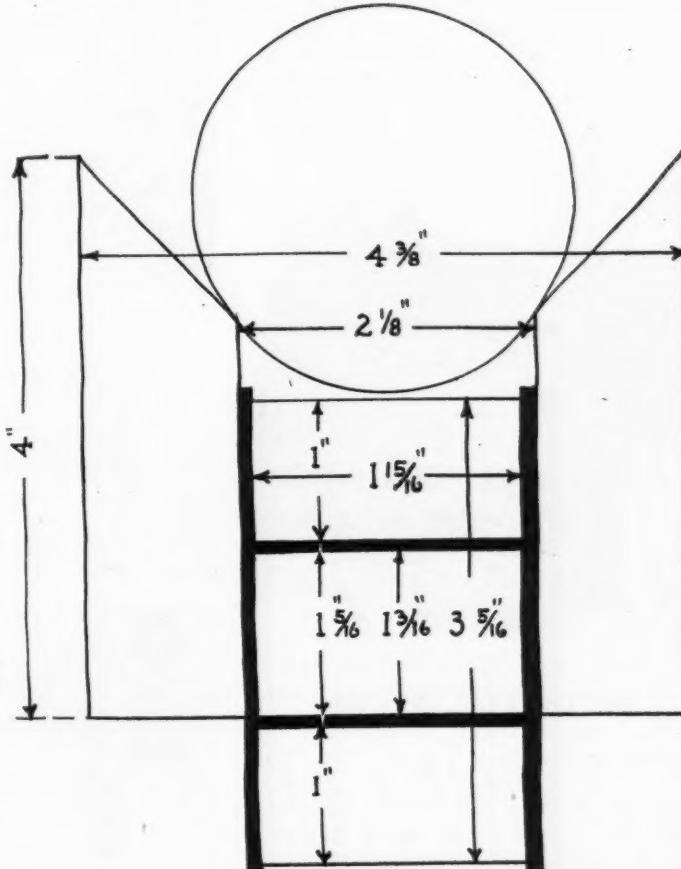


FIG. 1.
GROWLER WINDING END VIEW *100805

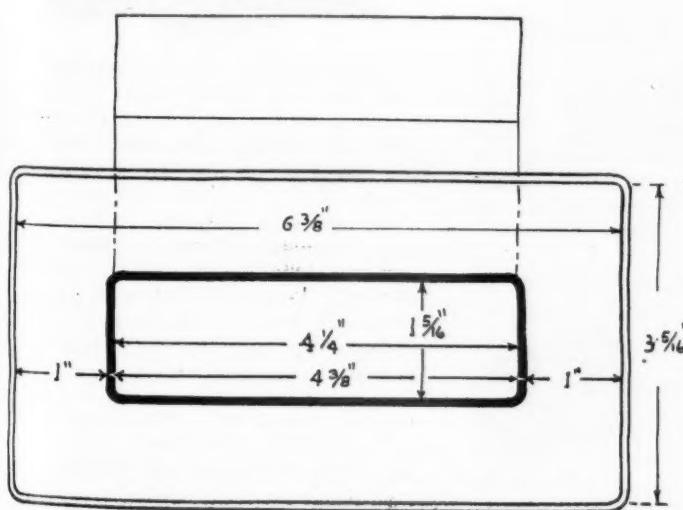


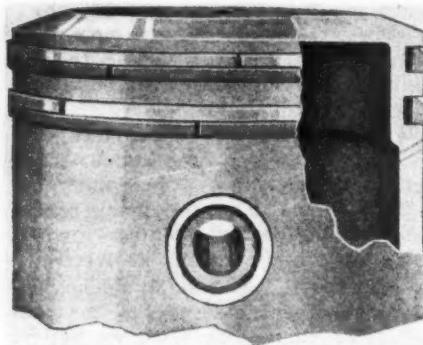
FIG. 2.
GROWLER WINDING SIDE SECTIONAL VIEW
*100805

The ACCESSORY SHOWCASE

New Sources of Retail Profit

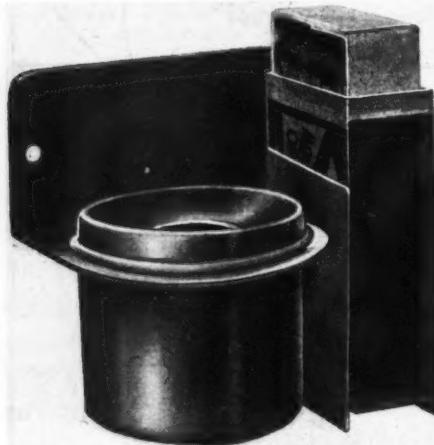
KENDELL PISTON RING

The Kendell Piston Ring is a two-piece type and is of 55 deg. angle construction, which relieves groove pressure and increases pressure on the circumference. The feature of this ring is that it is recessed around the top with a scraper groove which tends to carry the oil to the bottom. Kendell Engineering Corp., Ft. Wayne, Ind.



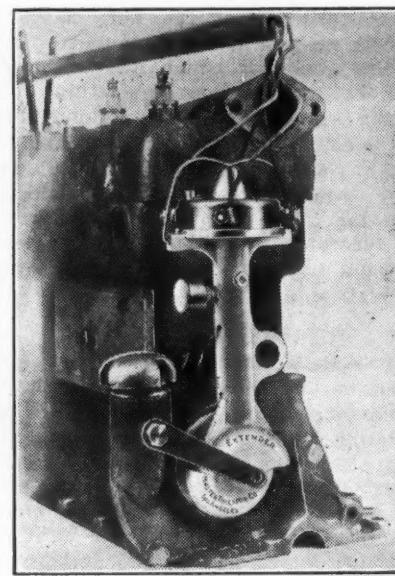
HAN-D ASH TRAY

The Han-D Ash Tray sells for \$1. It is nickelated and packed in an individual box. Match and ash compartments are incorporated, and it can be fastened to cowl or side of car.—Patented Specialties Co., 314 Nicollet Avenue, Minneapolis,



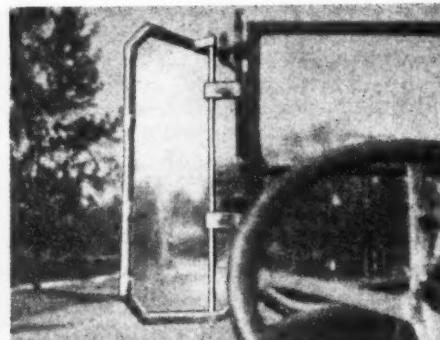
MASTER TIMER EXTENDER

The Master Timer Extender is the product of the Master Timer Mfg. Co., 111 E. Washington Street, Los Angeles, Cal. Its purpose is to remove the timer from the oil and grease of the pan and set it in an upright position as shown in the cut. This inverted position causes the timer to shed oils and dirt and places it where it can be readily cleaned. \$5.75.



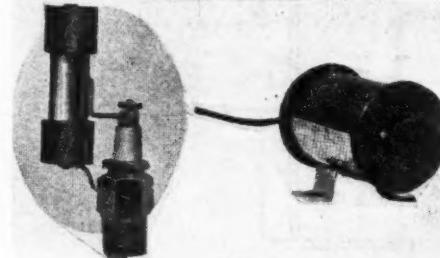
TO-NIX WIND DEFLECTORS

To-Nix Wind Deflectors are made by the Tooker-Nixon Co., Inc., Stamford, Conn., and sell at \$20 per pair.



REEVES SPARK CONDENSER

The Reeves Spark Condenser is made in two types, a coil, adjustable type for large cars and a plug type for Fords. The price of the former is \$5 and the latter \$3.50. The purpose of the Reeves Spark Condenser is to give a hotter spark. Both types are shown in the cut. Reeves Co., Milford, Conn.



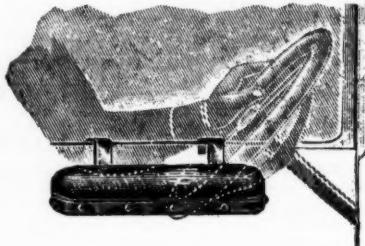
NO-RAD RUST

No-Rad Rust is a preparation to pre-

vent rust in the radiator and is made by the No-Rad Rust Oil Co., Lancaster, Pa., to sell at \$1 a can.

ARM RESTS FOR FORDS

Made especially for the Ford sedan and coupe, these arm rests afford a handy support for the driver's arm. \$1.50. Sterling Auto Devices Co., 206 S. Jefferson Street, Chicago.



CHAMP SPRINGS

Replacement springs for every make of automobile are supplied by the Champ Spring Co., 2107 Chateau Street, St. Louis, Mo. Special leaf springs are also manufactured for any make of car or truck.

GREEN LINK FAN BELTS

Green Link Fan Belts are made of special leather and treated to prevent water damage and oil and grease effects. They are made to sell at two prices—75 cents for Ford size and \$1 for all others. Jewell Belting Co., Hartford, Conn.



PROTEXALL SPRING OILER

The Protexall Spring Oiler, by keeping the springs working in oil constantly, keeps the springs free from rust and dust, and preserves their original resiliency.

The appliance consists of a compact metal housing, which is lined with a thick padding of felt. This felt padding is kept saturated with oil from an oil cup and oil chamber in top of housing. The oil seeps in between the sides of the springs and is evenly distributed between the spring leaves by combined movement of the spring itself and by capillary attraction.

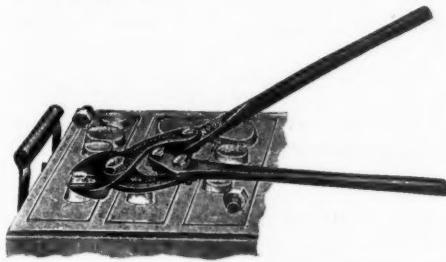
The Protexall Oilers are adjustable to any size spring for passenger cars and come two in a carton, one pair for each spring. A special set of four for Fords is offered. Globe Superior Corp., Adington, Illinois.

SERVICE EQUIPMENT

Aids for Time Saving & Accuracy

CHAMPION UTILITY CLIPPER

The Champion Utility Clipper is drop forged. The angle of the jaws throws the handles of the clipper above a level plane so that any position of work is attainable. It is 10½ ins. long and weighs 2¼ lbs. Champion Tool Co., Meadville, Pa.



MARVEL VALVE GRINDER FOR BUICKS

The Marvel Valve Grinder for Buicks is shown in the accompanying cut. It is used in the same manner as similar sets. Autoquip Mfg. Co., Rochester, N. Y.



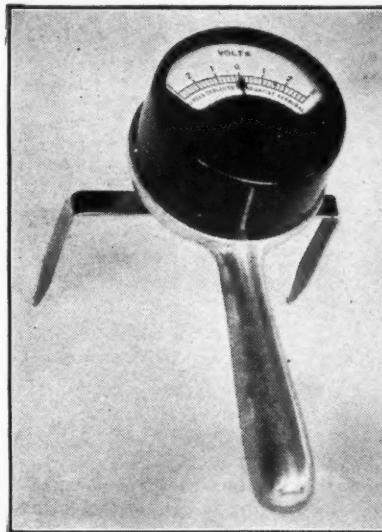
BESCO BATTERY BOX SCRAPER

Made to scrape sides, bottom and covers of battery boxes. In cleaning out accumulation of deposits, makes replacement of rubber jars easy. Made of dropped, forged steel, edges hardened and ground on the five scraping sides. Size 12 ins. long, one and one quarter ins. wide. 50 cents. Battery Equipment & Supply Co., 1458 Michigan Avenue,



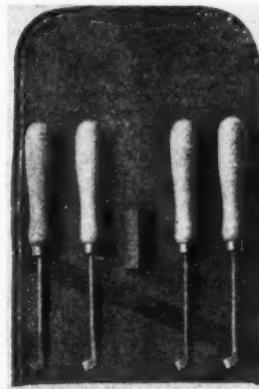
HYRATE VOLT CHECKER

This is a voltmeter with a zero center scale reading to three volts on either side. It is equipped with two spikes and a handle. Only one hand is used in making the reading, leaving the other free for recording. With the zero center scale there is no danger of reversing the meter as the needle will swing either way. The checker will also find polarity as the needle swings toward the negative post. Price \$12.50. Service Station Supply Co., 30 E. Larned Street, Detroit.



THOMPSON'S DRAW CUT UNDER-CUTTERS

Thompson's Draw Cut Undercutters are a complete set of graver type tools for undercutting commutators on generators and starting motors. The set consists of four gravers which are marked 1, 2, 3 and 4, also one hardened and ground box guide put up in a neat roll. Price \$1.75. Thompson Mfg. Co., Meadville, Pa.



LIST TIRE AND RIM MACHINE

The List Tire and Rim Machine is made for use in the repair departments of dealers' establishments, tire shops or fleet owners' garages. All parts are made of malleable iron and cold rolled steel. It is intended, principally, to remove tires from split rims and is constructed with three operating arms connected with a center pivot by a toggle or loose-working bar. The lower part of the arm is attached to the foot of a pedestal, each of the arms is equipped with lifting jacks. The whole is operated by a center screw, to which is attached a hand operating bar. In operation the rim is placed

on the machine and, by working the center screw, the insertion of a screw driver in the open gap of the rim is made possible. This allows one lip of the rim to slip over the other thereby loosening the tension of the rim on the tire. Complete, \$40. E. J. List Mfg. Co., Havana, Ill.



SAUER'S ENGINE TIME INDICATOR

Sauer's Engine Time Indicator is made to tell the exact timing of ignition and valves in any gasoline engine. \$2.50. Sauer Bros. 4th and Main Streets, Chico, Calif.



HUTTO CYLINDER LAP

The Hutto Cylinder Tool is intended for truing cylinders. It is built with detachable jaws and wide range of adjustment. The adjustment is fixed when set at any size until changed by the operator. The price of the Hutto Cylinder Tool, complete with one set of jaws, handle and universal joint, is \$15. Each additional set of jaws, \$3; five to a complete set. Drill press or electric drill attachment, \$1. Lapping tool with five sets jaws that will take all sizes from 2 13/16 inch to 4 1/8 inch bore, and drill attachment, complete in box, \$24.50.

Show the Truck Owner the Worn Parts

A Western Dealer Does This to Convince Customers, Just as a Dentist Shows the Patient the Old Tooth

If the opportunities that are presented are recognized and promptly and properly cultivated, the maintenance department of an automobile or truck dealer establishment can be developed into a substantial indirect producer of sales. This is particularly so with retail truck establishments, in the opinion of the Service Truck Sales Co., of Los Angeles, which has made its service department a consistent developer of truck sales.

"To make every customer having repair work done a completely satisfied customer, because every satisfied customer of the service department is a warm prospect for the sales department," is the plan of operations of the Los Angeles organization.

E. G. Whipple and H. E. Chapler, of the Los Angeles truck distributors, believe it is a decidedly unwise step for a truck or automobile establishment to restrict its service appeal to the particular machine or machines handled. By so doing, the dealer loses his opportunity to cultivate an acquaintance with owners of other makes of trucks who should be on his prospect list.

At the Service Truck Sales Company repair work is solicited on all makes of trucks and the service department is kept open every night until 10:30 P. M. as an inducement to owners whose trucks are in service during the day to patronize this service department for work that does not require much time. When a repair job has been completed, the service superintendent introduces the owner to the general manager or sales manager of the company, if he has not previously met him. The executive personally thanks the owner for offering the company the opportunity to repair his truck. He makes no effort to force any sales talk on new trucks.

Two weeks or a month after a job is completed the service superintendent or the mechanic who worked on the job personally visits the owner to inquire if everything is satisfactory. After another month has gone by, another call is made, this time merely as a "friendly



Miniature reproduction of repair parts bag used for mailing the letter shown below

call." The emissary of the service department "happened to be going by your place" so he just dropped in for a call.

Whipple believes that by rendering efficient service on any make of truck, a truck company cannot help but encourage sales of his own line to owners who have patronized his repair department.

One of the most interesting features

of the repair department of the Service Truck Sales Company is the so-called "bag system" for parts. The owner who puts his truck in this shop with instructions to "Overhaul it and replace all parts that require replacement," receives a telephone call from the service superintendent after an inspection has been made. The superintendent outlines the work that must be done and asks for confirmation of original instructions.

Every old part that is replaced is placed in a bag assigned to the owner of this particular truck. No matter how insignificant the part, be it cotter pin, washer or bolt, it is put in the bag. Along with the itemized bill that is submitted to the owner, is the bag containing the parts that have been replaced.

The "bag system" was evolved by the Service Truck Sales Company as a plan to instill confidence among truck owners in the work of the repair department. As every part that has been replaced is in the bag that is given the owner, he can carefully check the number of parts against the itemized statement. Also, he can see the condition of the parts removed.

Just as a person's curiosity impels him to ask the dentist to show him a tooth that has been extracted from his mouth, so does the owner of a truck, or any automotive vehicle for that matter, claim interest in parts replaced in his machine.

"We have found the 'bag system' a popular feature of our shop work," said Mr. Chapler. "It is a great builder of confidence."

The bags, which come in various sizes, are made of white canvas and carry the name, address and telephone number of the owner, along with the trademark of the Service Motor Truck Company on one side, the words, "These Parts Need Replacing" on the reverse side.

The small bags are also used to advantage for advertising purposes. Circular letters addressed to truck owners are enclosed in the bags and sent through the mails to truck owners. The circular letters are devoted largely to an explanation of the "bag system" and the class of work done in the repair shop.

SERVICE TRUCK SALES COMPANY
SOUTHERN CALIFORNIA DISTRIBUTORS FOR
Service MOTOR TRUCKS
1715 SOUTH LOS ANGELES STREET
Los Angeles, Calif.
April 4th, 1922.

Mr. R. G. Allen
1042 So. Westlake
Los Angeles, Calif.

Dear Sir:-

Our reason for sending you in this fashion a letter of such importance, is to point out one of the MONEY SAVING FEATURES of our repair department.

This miniature bag will help us in a sense to explain our "Bag System", which you will admit is a good one.

Suppose you put your truck in our shop and instruct us to "overhaul it and replace all parts that require it." We inspect your truck, report what should be done, and await your confirmation before proceeding with the work. Then, every part replaced, no matter how insignificant—cotter pin, washer or bolt—you will find the old parts are put into a bag. When the itemized bill is submitted, you will find that the bag contains every duplicated part.

As for labor, each job carries its own time card, and you are only charged for the actual time put on same, which is accurately kept by punching a time clock.

Repair work is only a part of our business, and it is not the source of our principal income. We are confident though that we can convince you by the service we give and the reasonable charges made that we are a good truck concern to deal with.

Remember, we sell SERVICE TRUCKS built in all capacities and wheel bases from 3/4 to 6 tons.

Trusting to be favored with a portion of your business,
we remain

Very truly yours
SERVICE TRUCK SALES COMPANY
By E. G. Whipple

H. E. Chapler

The letter used to explain the "bag system" to customer. This system was evolved as a plan to instill confidence in the work of the repair department

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Detroit	Enclosed Car Salon at General Motors Bldg., Detroit Automobile Dealers' Assn.	Oct. 17-21
Pittsburgh	Twenty-fifth Annual Automobile Show	Oct. 14-21
Wash'gton, City of	Enclosed Car Salon.....	Oct. 21-28
Los Angeles	Automobile Show, Motor Car Deal- ers' Association	Nov. 11-19
Chicago	Annual Show of the Automotive Equipment Association	Nov. 13-18
Cincinnati, O.....	Second Annual Automobile and Radio Exposition	Nov. 23-29
New York.....	Eighteenth Annual Automobile Salon	Dec. 3-9
New York.....	National Automobile Body Build- ers' Show	Jan. 8-13
New York.....	Annual Show	Jan. 6-13
Cleveland, O.....	Annual Winter Show, Cleve- land Automobile Mfr's and Dealers' Assn.	Jan. 20-27

Brooklyn, N. Y....Annual Automobile Show of the
Brooklyn Motor Vehicle Deal-
ers' AssociationFeb. 24-Mar. 3

Chicago

Annual Show at Coliseum
N. A. C. C.....Jan. 27-Feb. 3

Minneapolis, Minn. Annual ShowFeb. 3-10

CONVENTIONS

Chicago	Nat'l Association of Farm Equip- ment Manufacturers	Oct. 18-20
Washington	Second Annual Conference of the Highway Education Board.....	Oct. 26-28
Chicago	Annual Meeting Automotive Equip- ment Association	Nov. 13-18
Toledo	Annual Convention of the Ohio Automotive Trades' Assn.....	Dec. 6-8

FOREIGN SHOWS

London

Annual Show

Nov. 3-11

RACES

San Carlos, Calif.—500-Mile Armistice Day Race.....Nov. 11

Los Angeles, Calif.....Nov. 30

San Diego, Calif.....January

SQUEEKS & RATTLES

If You Know Any, Tell Them to Us

And So It Goes

It isn't very often you run into the kind of chap we have in mind just now. They don't show in the whirl of every day, and yet we can't help but feel that he was part of something big, in a day now gone. It was on Madison street in the port of lost men we met him and he pan-handled us for a thin one. To secure a cup of java with and his tale of woe was one that sounded true and so we gave him the thin one. He told us of a start he made some years ago in the Garage business, and he had gone to the wall within a Twelvemonth. It seems he had been a good fellow and a sucker, doing this and that for nothing when he should have been paid, at least a thin one. Anyway, His methods didn't work out right and he soon found that he was without a penny. He grew discouraged and, finally landed there on Madison street. He doesn't intend to stage a "come-back," he says, because people don't appreciate a good fellow in business—And he was a good fellow. Now maybe this guy was spoofing us, but, his "words are logic" and contain some stuff to think about. Anyway, we gave him the thin one and he had his cup of java.—J. V. M.

OR, WHAT HAVE YOU?

comes still another letter from an indignant contributor in Chicago, calling our attention to the fact we have overlooked him in our effort to locate the most ingenious inventor in the automotive world. He says:

"Dear Mr. Squeeks & Rattles:

These guys with their rapid tire changing rim make me sick. I was born and raised in the automotive business, having also spent some time with the Automotive Equipment Forces in the recent European fracas and it was while there, kind sir, that I discovered what I have discovered.

You know the duke what wrote 'Dear Old Pal'—he was on guard or, under guard of somethin' one night where no woman belonged, when he got the inspiration. Well, my case was very much the same. It was a very wet day and very foggy—the Helleses had been showering us with lead and other solids when our second foot stepped out of the dugout onto my feet and said, 'Private Office, I want a man to drive a car over to trench number 15 with a pair of dry socks for General Nulzance, will you volunteer?' I didn't even bat an eyelash when he says, 'You're a brave man and its good of you to volunteer. Mebbe you'll get there all right and mebbe you won't, one thing you must remember is to get the socks to the general, he hasn't had a clean pair since the first of August, 1898.'

Realizing that I was being selected from over 1,000 men to do for my country a great service, I immediately went to my dugout and tried to shoot myself but the nosy loole stopped me and perched me up into the automobile with the clean socks. I hadn't released the brake before half of the car was swept away with German shells but I stuck to my job and slowly started over the great space known as 'No Man's Land.' Pretty soon the anti-Aliies had shot the motor out of the car and I found myself confronted with a gigantic problem—if General Nulzance didn't get his clean socks, what would happen? I would be shot for breakfast. I saw a large strip of sheet iron laying on the ground and I got out and picked it up and fastened it to the front of the car where the windshield ought to be. With the motor and the radiator gone, the German bullets began hitting the iron sheet and bouncing down against the front wheels, through the frame. They came so fast that the first thing I knew, I was sailing along toward trench fifteen at a terrific speed and I flopped into it with the general's socks.

"My boy, said the general, 'you have saved the day, without those socks, I could

never have had a good time at the dance to-night' and he reached up and grabbed a medal off his vest and pinned it on me. He didn't know it but it was a piece of corned beef which had missed his mouth at dinner time.

I think, kind sir, that this ought to take the cheese cloth umbrella in your contest for the most ingenious inventor, don't you?

The letter is signed Inner Office and we think that it at least deserves to be shown to our readers. Have you an ingenious invention which we could tell the world about? For next week's letter, we offer an India rubber socket wrench.

The Turnover Tune

Said the clock to the dealer,
To the dealer and his stock.
"I am ticking off your profits,"
To the dealer said the clock,
"Custom, custom every minute!
Luck is in it—luck is in it!
Where's the risk when Trade is brisk!
Tick-tock! Tick-tock!"
"You're a liar, you're a stealer,"
Said the dealer to the clock.
"Ticking up my carrying charges—
Making mock—making mock!
Fractions up to dollars mounting
Til they leave my profits nil;
Just reversing my accounting!
Stand still—stand still!"
Oh the goods we bought so gaily
And the goods that will not go!
Adding costs forever daily
Till we tear our hair with woe!
Moods and tenses of expenses
On the poor retailer's stock—
And that devilish little revel
"Twixt the profits and the clock!

—William R. Benet.

WHAT D'YE MEAN "NEWS ITEM"?— BIOGRAPHY'S THE WORD

A news item concerning Eddie Rickenbacker is sent out which reads like this:

"Paris, France, Oct. 2: Capt. E. V. Rickenbacker, Detroit automobile manufacturer of a car designed and built by and named for him, who with his bride, is honeymooning at the scenes of his sensational air battles which returned him America's Ace of Aces at the close of the world war, is very much impressed at the progress of aviation in Europe, especially in France where the Government has created a subsidy to assist commercial aviation."

Some breath-snatcher of a sentence!

Spark Plug: An article that may be missing yet never leave the motor.

Short Circuit: An electrical detour.

Plugs: An ancient horse; chewing tobacco; see spark plug.

Tail Light: An electrical device with whims.

Boiler: Term used by a customer in speaking of the car you sold him.

Send in your definitions for motor terms to Squeeks & Rattles.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	TIRES				Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	TIRES				Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	TIRES				Final Drive	
			Bore and Stroke	Front	Rear	Bore and Stroke					Bore and Stroke	Front	Rear	Bore and Stroke	Front	Rear			Bore and Stroke	Front	Rear			
Acason.....	3 $\frac{1}{2}$ -1	\$1650a	3 $\frac{1}{2}$ x5	34x5n	34x5n	W		Commerce.....	16	2	3 $\frac{1}{2}$ x5	35x5n	36x6n	1		Garford....	150-A	7 $\frac{1}{2}$	\$5200	5 x6 $\frac{1}{2}$	36x6	40x7d	C	
Acason.....	RB	1 $\frac{1}{2}$	1950	3 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x3 $\frac{1}{2}$	36x6	W	Commerce.....	18	2 $\frac{1}{2}$	2150	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	1	Gary.....	F	1-1 $\frac{1}{2}$	1775	3 $\frac{1}{2}$ x5	36x3 $\frac{1}{2}$	36x5	W	
Acason.....	H	2 $\frac{1}{2}$	2750	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	3ix1	36x8	W	Commerce.....	18	2 $\frac{1}{2}$	2495	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x6n	40x8n	1	Gary.....	J	2	2450	4 x5 $\frac{1}{2}$	36x3 $\frac{1}{2}$	36x6	W	
Acason.....	L	3 $\frac{1}{2}$	3450	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x10	W	Commerce.....	25	2 $\frac{1}{2}$	2425	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Gary.....	K	3 $\frac{1}{2}$	2850	1 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x8	W	
Acason.....	M	45	4350	5 x3 $\frac{1}{2}$	36x6	40x12	W	Commerce.....	25	2 $\frac{1}{2}$	2770	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x6	40x8n	W	Gary.....	M	5	3790	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	40x5d	W	
Ace.....	30	11-13	2400	3 $\frac{1}{2}$ x5	31x3 $\frac{1}{2}$	31x6	W	Cook.....	51	2 $\frac{1}{2}$	3600	4 x5 $\frac{1}{2}$	36x6	40x8n	W	Gary.....	N	5	4450	3 x6 $\frac{1}{2}$	36x6	40x6d	W	
Ace.....	41	2	2850	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x8	W	*Corbit.....	3 $\frac{1}{2}$ -1		1250	3 $\frac{1}{2}$ x5	36x5	33x5	W	Gary.....	O	5	4700	3 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x3 $\frac{1}{2}$	36x7	W	
Ace.....	60	2 $\frac{1}{2}$ -3	3400	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x8	W	Corbit.....	E-2	1	1480	3 $\frac{1}{2}$ x5	31x3 $\frac{1}{2}$	31x4	W	Gary.....	P	1-1 $\frac{1}{2}$	1775	3 $\frac{1}{2}$ x5	36x3 $\frac{1}{2}$	36x6	W	
Acme.....	21	1	...	3 $\frac{1}{2}$ x5	35x5n	35x5n	W	Corbit.....	D-2	1 $\frac{1}{2}$	2200	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	31x5	W	Gary.....	Q	2	3500	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x8	W	
Acme.....	39	1 $\frac{1}{2}$	3400	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	W	Corbit.....	C-2	2	2600	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x3 $\frac{1}{2}$	36x7	W	Gary.....	R	3	4500	1 $\frac{1}{2}$ x6	36x5	40x12	W	
Acme.....	40	2	3400	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	W	Corbit.....	B-2	2 $\frac{1}{2}$	3000	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Gary.....	S	4	3375	4 x5 $\frac{1}{2}$	36x4	36x8	W	
Acme.....	63	3	4150	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Corbit.....	R-2	3	3200	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x8	W	Gary.....	T	5	4475	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x10	W	
Acme.....	60L	3	...	4 $\frac{1}{2}$ x5	36x4	36x7	W	Corbit.....	A-2	3 $\frac{1}{2}$ -4	3800	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x10	W	Gary.....	U	6	5500	5 x6 $\frac{1}{2}$	36x6	40x14	W	
Acme.....	93	4 $\frac{1}{2}$	4150	1 $\frac{1}{2}$ x5	36x5	40x10	W	Corbit.....	AA-2	5	4500	4 $\frac{1}{2}$ x6	36x6	40x6d	W	Graham Bros..	V	1	1265	3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33x4 $\frac{1}{2}$	34x5n	B	
Acme.....	125	6 $\frac{1}{2}$	4150	4 $\frac{1}{2}$ x6	36x6	40x12	W	Graham Bros..	W	1 $\frac{1}{2}$	1325	3 $\frac{1}{2}$ x4 $\frac{1}{2}$	33x4 $\frac{1}{2}$	34x6n	B	Gramm-Pioneer..	X	1	1245	3 $\frac{1}{2}$ x5	33x5n	33x5n	B	
American.....	23	2 $\frac{1}{2}$	3350	1 x6	36x4k	36xdk	W	Gramm-Pioneer..	Y	1 $\frac{1}{2}$	1750	3 $\frac{1}{2}$ x5	36x3 $\frac{1}{2}$	36x5k	W	Gramm-Pioneer..	Z	1	1245	3 $\frac{1}{2}$ x5	33x5n	33x5n	B	
American.....	43	4	4275	4 $\frac{1}{2}$ x6	36x5	36xdk	W	Day-Elder.....	AS	1	1600	3 $\frac{1}{2}$ x5	35x5n	35x5n	W	Day-Elder.....	B	1 $\frac{1}{2}$	2000	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	W	
American.....	50	5	4500	5 x6	36x5	36x12	W	Day-Elder.....	D	2	2400	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Day-Elder.....	C	2 $\frac{1}{2}$	2750	1 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	
Armedler.....	20	1	...	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x6k	W	Day-Elder.....	F	3 $\frac{1}{2}$	3150	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x5d	W	Day-Elder.....	E	5	4250	1 $\frac{1}{2}$ x6	36x5	40x6d	W	
Armedler.....	21	1 $\frac{1}{2}$	...	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x6k	W	Day-Elder.....	G	4	2590	3 $\frac{1}{2}$ x5	34x4	34x5	W	Dearborn.....	I	1	1600	25x5 $\frac{1}{2}$	35x5n	35x5n	W
Armedler.....	40-B	1 $\frac{1}{2}$	2475	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	W	Day-Elder.....	H	4	2180	3 $\frac{1}{2}$ x5	34x4	34x5	W	Dearborn.....	J	2	2300	3 $\frac{1}{2}$ x5	31x4	34x5	W	
Armedler.....	40-C	1 $\frac{1}{2}$	2475	4 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x6k	W	Defiance.....	D	1 $\frac{1}{2}$	2400	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Defiance.....	K	2	2750	1 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	
Armedler.....	41-C	1 $\frac{1}{2}$	2475	4 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x6k	W	Defiance.....	L	2	2075	3 $\frac{1}{2}$ x5	35x5n	35x7n	W	Defiance.....	M	3	2150	3 $\frac{1}{2}$ x5	35x5n	35x7n	W	
Armedler.....	HW-B	2 $\frac{1}{2}$	...	4 $\frac{1}{2}$ x5	36x4k	36x7k	W	Defiance.....	N	4	2180	3 $\frac{1}{2}$ x5	34x4	34x5	W	Dearborn.....	O	4-5	2590	3 $\frac{1}{2}$ x5	34x5	34x5	W
Armedler.....	HW-C	2 $\frac{1}{2}$	...	4 $\frac{1}{2}$ x6	36x5	36xdk	W	Defiance.....	P	5	2590	3 $\frac{1}{2}$ x5	34x4	34x5	W	Dearborn.....	Q	5-6	4450	4 $\frac{1}{2}$ x6	36x8	40x6d	W
Armedler.....	*Atlas.....	22	1	1495	3 $\frac{1}{2}$ x5	31x4 $\frac{1}{2}$	34x4 $\frac{1}{2}$ n	W	Defiance.....	R	6	2590	3 $\frac{1}{2}$ x5	34x4	34x5	W	Dearborn.....	R	7	3100	3 $\frac{1}{2}$ x5	34x5n	38x7n	W
*Atlas.....	*Atlas.....	44	1 $\frac{1}{2}$ -2	1950	3 $\frac{1}{2}$ x5	36x6	36x6n	W	Defiance.....	S	7	2375	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x6	W	Dearborn.....	S	8	3275	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x6	W
Attberry.....	20R	1 $\frac{1}{2}$	2475	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	W	Defiance.....	T	8	2475	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Defiance.....	T	9	3250	3 $\frac{1}{2}$ x5	36x4	36x7	W	
Attberry.....	22C	2 $\frac{1}{2}$	3375	4 $\frac{1}{2}$ x5	36x4	36x4d	W	Defiance.....	U	10	2475	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x4	36x7	W	Defiance.....	U	11	3100	3 $\frac{1}{2}$ x5	34x5n	38x7n	W	
Attberry.....	22D	3 $\frac{1}{2}$	4275	4 $\frac{1}{2}$ x5	36x5	40x5d	W	Defiance.....	V	11	2475	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x8	W	Defiance.....	V	12	3275	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x5	36x8	W	
Attberry.....	8E	5	4975	4 $\frac{1}{2}$ x6	36x5	40x6d	W	Defiance.....	W	12	2475	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x6	40x6d	W	Defiance.....	W	13	3100	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	36x6	40x6d	W	
Autocar.....	21UF	1 $\frac{1}{2}$ -2	1950	4 $\frac{1}{2}$ x5	34x4	34x6	D	Dependable.....	A	3 $\frac{1}{2}$ -1	1650	3 $\frac{1}{2}$ x5	34x5	36x6n	W	Dependable.....	B	4	1645	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	I	
Autocar.....	21UG	1 $\frac{1}{2}$ -2	2050	4 $\frac{1}{2}$ x5	34x4	34x6	D	Dependable.....	C	4	2350	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	34x5	W	Dependable.....	D	5	2145	4 x5	34x5	36x6	I	
Autocar.....	27H	2-3	2950	4 x5	34x5	36x7	D	Dependable.....	E	6	2650	4 x5	34x5	36x6	W	Dependable.....	F	7	2300	3 $\frac{1}{2}$ x5	34x4	36x10	W	
Autocar.....	27K	2-3	3075	4 x5	34x5	36x7k	D	Diamond T.....	T-0-3	8	1975	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	36x4n	W	Diamond T.....	U-2	9	2650	4 x5	36x5	40x6d	W	
Autocar.....	26-B	4-6	3950	1 $\frac{1}{2}$ x5	34x3	36x12	D	Diamond T.....	T	10	2255	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	36x3 $\frac{1}{2}$	W	Diamond T.....	U	11	2900	4 x5	36x5	36x5d	W	
Autocar.....	26-B	4-6	4100	1 $\frac{1}{2}$ x5	34x3	36x12	D	Diamond T.....	V	12	2255	3 $\frac{1}{2}$ x5	34x3 $\frac{1}{2}$	36x3 $\frac{1}{2}$	W	Diamond T.....	W	13	2900	4 x5	36x5	36x5d	W	
Bessemer.....	K-2	2	1195	3 $\frac{1}{2}$ x5	35x5	35x5n	B	Eagle.....	101	11 $\frac{1}{2}$	1875	3 $\frac{1}{2}$ x5 $\frac{1}{2}$	34x5	34x5	I	Eagle.....	100-2	2	2275	3 $\frac{1}{2}$ x5 $\frac{1}{2}$	34x4k	34x7k	I	
Bessemer.....	K-2	2	1195	3 $\frac{1}{2}$ x5	35x5	35x5n	B	Eagle.....	100-2	2	2275	3 $\frac{1}{2}$ x5 $\frac{1}{2}$	3											

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	
				Front	Rear						Front	Rear						Front	Rear		
Kleiber...BB	2	\$3600	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x7	W	Old Hickory...W	1	\$1775	3 ¹ / ₂ x4 ¹ / ₂	36x3 ¹ / ₂	36x4 ¹ / ₂	W	Seneca...M	1 ¹ / ₂	\$820	3 ¹ / ₂ x4 ¹ / ₂	30x3 ¹ / ₂	30x3 ¹ / ₂	B	
Kleiber...B	2 ¹ / ₂	3950	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x8	W	Old Reliable...A	1 ¹ / ₂	2350	4 x5	31x4	36x6	W	*Service...12	3 ¹ / ₂	3 ¹ / ₂ x4 ¹ / ₂	32x3 ¹ / ₂	32x3 ¹ / ₂	B		
Kleiber...C	3 ¹ / ₂	4600	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x5	W	Old Reliable...B	2 ¹ / ₂	3500	4 ¹ / ₂ x4 ¹ / ₂	31x4	36x4	W	*Service...25	3 ¹ / ₂	3 ¹ / ₂ x5 ¹ / ₂	31x5	36x5	B		
Kleiber...D	5	5300	5 x5 ¹ / ₂	36x6	40x12	W	Old Reliable...C	3 ¹ / ₂	4250	4 ¹ / ₂ x6	36x5	36x5	W	Service...21	1 ¹ / ₂	—	3 ¹ / ₂ x5 ¹ / ₂	34x5	W		
Koehler...D	1 ¹ / ₂	2150	3 ¹ / ₂ x5	31x3 ¹ / ₂	34x6	W	Old Reliable...D	5	5000	4 ¹ / ₂ x6	36x6	40x6d	W	Service...32	2	—	4 x5	36x3 ¹ / ₂	36x7	W	
Koehler...M	2 ¹ / ₂	3175	4 x5 ¹ / ₂	36x4	36x7	W	Old ReliableKLM	7	6000	4 ¹ / ₂ x6	36x6	40x7d	W	*Service...37	2	—	4 x5	35x5n	38x7n	W	
Koehler...MCS	2 ¹ / ₂	3275	4 x5 ¹ / ₂	36x4	36x7	W	*Oldsmobile Econ	1	1095	3 ¹ / ₂ x5 ¹ / ₂	35x5	35x5n	W	Service...52	3	—	4 ¹ / ₂ x5 ¹ / ₂	36x4	W		
Koehler...F	3	4470	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x10	W	Olympic...A	2 ¹ / ₂	3200	4 ¹ / ₂ x4 ¹ / ₂	36x4	36x8	W	Service...72	3 ¹ / ₂	—	4 ¹ / ₂ x5 ¹ / ₂	36x5	W		
Koehler,MT. Trac	5	3275	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x7	W	Oneida...B9	1 ¹ / ₂	2825	4 x5 ¹ / ₂	36x3 ¹ / ₂	36x7	W	Service...77	4	—	4 ¹ / ₂ x6	36x5	36x5	W	
Krebs...23	3 ¹ / ₂	1360	3 ¹ / ₂ x5 ¹ / ₂	31x4 ¹ / ₂	34x1 ¹ / ₂	B	Oneida...C9	2 ¹ / ₂	3200	4 x5 ¹ / ₂	36x4	36x8	W	Service...102	6	—	4 ¹ / ₂ x6	40x6d	W		
Krebs...24	24	1675	3 ¹ / ₂ x5 ¹ / ₂	31x5	34x5	W	Oneida...D9	3 ¹ / ₂	4050	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x10	W	Signal...NF	1	1450	3 ¹ / ₂ x5 ¹ / ₂	34x5	36x6a	W	
Krebs...45	1 ¹ / ₂	2275	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x7	W	Oneida...E9	5	4725	4 ¹ / ₂ x5 ¹ / ₂	36x6	40x12	W	Signal...H	1 ¹ / ₂	1950	4 ¹ / ₂ x5 ¹ / ₂	34x4	36x6	W	
Krebs...75	75	2550	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x8	W	Oshkosh...AA	2	2485	3 ¹ / ₂ x5 ¹ / ₂	36x6n	36x6n	B	Signal...J	2 ¹ / ₂	2375	4 ¹ / ₂ x5 ¹ / ₂	34x4	36x8	W	
Krebs...110	3 ¹ / ₂	3175	4 ¹ / ₂ x5 ¹ / ₂	36x5	40x10	W	Oshkosh...AB	2 ¹ / ₂	3485	4 x5 ¹ / ₂	38x7n	38x7n	B	Signal...M	3	3175	4 ¹ / ₂ x5 ¹ / ₂	36x5	40x5d	W	
Larrabee...X-2	1	1925	3 ¹ / ₂ x4 ¹ / ₂	34x5n	34x5n	B	Oshkosh...BB	2 ¹ / ₂	3585	4 x5 ¹ / ₂	38x7n	38x7n	B	*Standard...75	75	1 ¹ / ₂	1330	3 ¹ / ₂ x5 ¹ / ₂	33x5n	33x5n	W
Larrabee...U	1 ¹ / ₂	2100	3 ¹ / ₂ x4 ¹ / ₂	34x3 ¹ / ₂	34x5	W	*Overland...4	2 ¹ / ₂	425	3 ¹ / ₂ x4 ¹ / ₂	30x3 ¹ / ₂ n	30x3 ¹ / ₂ n	B	Standard...1-K	1 ¹ / ₂	1600	3 ¹ / ₂ x5 ¹ / ₂	34x3	34x5k	W	
Larrabee...J	1 ¹ / ₂ -21	2400	3 ¹ / ₂ x5	34x3 ¹ / ₂	34x5k	W	Packard...EC	2-3	3100	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x7	W	Standard...76	2 ¹ / ₂ -3	2400	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x8	W	
Larrabee...K	2 ¹ / ₂ -3	3100	1 ¹ / ₂ x5 ¹ / ₂	36x4	36x7	W	Packard...EX	2-2 ¹ / ₂	3100	4 ¹ / ₂ x5 ¹ / ₂	36x6n	40x8n	W	Standard...66	3 ¹ / ₂ -5	3150	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x12	W	
Larrabee...L	3 ¹ / ₂ -3	3450	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x8	W	Packard...ED	3 ¹ -4	4100	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x6d	W	Standard...5-K	5-7	4400	4 ¹ / ₂ x5 ¹ / ₂	36x6	40x14	W	
Larrabee...M	4 ¹ / ₂ -5	4000	1 ¹ / ₂ x5 ¹ / ₂	36x5	36x11	W	Packard...EF	6-7 ¹ / ₂	4500	5 x6	36x6	40x6d	W	*Star...*	—	—	610b	3 ¹ / ₂ x5 ¹ / ₂	30x3 ¹ / ₂ n	30x3 ¹ / ₂ n	B
Larrabee...P	5-7	4800	1 ¹ / ₂ x6	36x6	40x11	W	Packard...Paige	5-12	1950	4 x5 ¹ / ₂	31x3 ¹ / ₂	31x5	W	Sterling...Sterling	1 ¹ / ₂	2855	1 ¹ / ₂ x5 ¹ / ₂	36x5	36x12	W	
Maccar...L	1 ¹ / ₂	—	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x6	W	Packard...Paige	5-13	3145	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x5	W	Sterling...Sterling	2 ¹ / ₂	3085	4 x5 ¹ / ₂	36x4	36x8	W	
Maccar...H-A	2	—	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x4d	W	Packard...Paige	5-14	3200	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x5	W	Sterling...Sterling	3 ¹ / ₂	4235	4 x5 ¹ / ₂	36x5	40x5d	W	
Maccar...H-2	3	—	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x4d	W	Packard...Paige	5-15	3145	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x5	W	Sterling...Sterling	4-5	4950	5 x6	36x6	40x6d	C	
Maccar...M-3	4	—	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x6d	W	Parker...C-22	1	1875	3 ¹ / ₂ x5 ¹ / ₂	31x5	31x5	W	*Stewart...Utility	4-14	1245	3 ¹ / ₂ x5 ¹ / ₂	34x4	34x4	W	
Maccar...G	5-6	—	4 ¹ / ₂ x5 ¹ / ₂	36x5	40x6d	W	Parker...G-22	2 ¹ / ₂	3200	4 ¹ / ₂ x4 ¹ / ₂	31x5	31x5	W	*Stewart...Utility	4-14	1445	3 ¹ / ₂ x5 ¹ / ₂	35x5n	35x5n	W	
MacDonald...A	7	5750	1 ¹ / ₂ x6	10x7	40x14	D	Parker...J-20	3 ¹ / ₂	3950	1 ¹ / ₂ x6	30x5	40x6d	W	Stewart...Stewart	15	1445	3 ¹ / ₂ x5 ¹ / ₂	35x5n	35x5n	I	
Mack...AB D.R.	1 ¹ / ₂	3450	4 x5	36x4	36x11	D	Parker...M-20	5	4850	5 x6	36x6	40x6d	W	Stewart...Stewart	16	1790	3 ¹ / ₂ x5 ¹ / ₂	34x4	34x4	I	
Mack...AB Chain	1 ¹ / ₂	3000	4 x5	36x4	36x11	D	Patriot...Revere	1	1380	3 ¹ / ₂ x5	35x5	35x5	W	Stewart...Stewart	17	2190	4 x5	34x4	34x7	I	
Mack...AB Chain	2	3300	4 ¹ / ₂ x5 ¹ / ₂	36x4	36x4d	W	Patriot...Lincoln	2	2050	4 x5 ¹ / ₂	34x4	34x4	W	Stewart...Stewart	18	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AB D.R.	2	3750	1 ¹ / ₂ x5 ¹ / ₂	36x4	36x4d	W	Patriot...LS-800	2	2175	4 x5 ¹ / ₂	34x4	34x4	W	Stewart...Stewart	19	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AB Chain	2 ¹ / ₂	3100	1 ¹ / ₂ x5 ¹ / ₂	36x4	36x4d	W	Patriot...Washgtn	3	2900	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x7	W	Stewart...Stewart	20	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AC Chain	2 ¹ / ₂	3450	5 x6	30x5	40x6d	W	Pierce-Arrow...2	1 ¹ / ₂	2200	4 x5 ¹ / ₂	36x4	36x6	W	Stewart...Stewart	21	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AC Chain	3	3450	5 x6	30x5	40x6d	W	Pierce-Arrow...2	2	2200	4 x5 ¹ / ₂	36x4	36x6	W	Stewart...Stewart	22	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AC Chain	5	5500	5 x6	30x8	40x6d	W	Pierce-Arrow...2	3	2200	4 x5 ¹ / ₂	36x5	36x6	W	Stewart...Stewart	23	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AC Chain	7	5750	5 x6	30x8	40x12	W	Pittsburgh...3	3	3800	4 ¹ / ₂ x5 ¹ / ₂	36x5	36x8	W	Stewart...Stewart	24	2190	4 x5 ¹ / ₂	34x5	34x5	I	
Mack...AC Chain	12	932	3 ¹ / ₂ x4 ¹ / ₂	32x3n	32x4n	W	Ranger...TK-20	2 ¹ / ₂	2450	3 ¹ / ₂ x4 ¹ / ₂	36x6n	38x7n	W	Titan...Titan	2 ¹ / ₂	2190	4 x5 ¹ / ₂	36x5	36x5	D	
Master...HT	1-1 ¹ /4	1650	4 x5	34x4	34x4	W	Ranger...TK-20	2 ¹ / ₂	2450	3 ¹ / ₂ x4 ¹ / ₂	36x6n	38x7n	W	Titan...Titan	3 ¹ / ₂	2190	4 x5 ¹ / ₂	36x5	36x5	D	
Master...H	1 ¹ / ₂	2475	4 x5	36x3	36x5	W	Ranger...TK-20	3 ¹ / ₂													

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	TIRES		Final Drive	
			Front	Rear					Bore and Stroke	Front					Bore and Stroke	Front		
Veteran.....P** 2	\$3609	4½x5½	30x4	30x7	W	White.....20	2	\$3250	33½x5½	30x4k	30x7k	D	Wichita.....O 4	\$3500	4½x6½	36x5k	36x5k	W
Veteran.....R** 3	4200	4½x5½	30x4	30x7	W	White.....40	3½	4200	3½x5½	30x5	40x5d	D	Wilcox.....AA 1	1900	3½x5½	36x4k	36x4k	W
Veteran.....S** 4	5395	4½x5½	30x5	30x10	W	White.....45	4500	1½x5½	30x6	40x6d	W	Wilcox.....BB 1½	2550	1½x5½	30x4	36x5	W	
*Vim.....29	1050	3½x4½	31x4	31x4	W	White Hick.....E 1	1225	3½x5½	31x5n	31x5n	W	Wilcox.....D 2½	3000	1½x5½	30x4	36x3½	W	
*Vim.....50	95	4 x5	32x4n	32x4n	B	White Hick.....H 1½	1375	3½x5½	36x3½	36x5	W	Wilcox.....E 3½	3050	1½x5½	36x5k	36x5k	W	
Walker-Johnson A 2	2500	3½x5½	34x3½	34x5	W	White Hick.....K 2½	1675	1½x5½	30x4	30x5	W	Wilcox.....F 5	4350	1½x5½	36x5	40x6d	W	
Walker-Johnson B 3	3000	4½x5½	30x4	30x8	W	Wichita.....K 1	1875	3½x5½	30x3½	30x4k	W	Wilson.....F 1½	2270	3½x5½	36x3½	36x5	W	
Walter.....M 5	3850	4½x5½	30x4	30x8	D	Wichita.....M 2	2400	3½x5½	30x3½	30x6k	W	Wilson.....EA 2½	2825	4½x5½	36x4	36x7	W	
Walter.....S 5	4850	4½x6½	30x6	40x6d	W	Wichita.....RX 3	3200	3½x5½	36x4k	36x8k	W	Wilson.....G 3½	3885	4½x5½	36x5	36x5	W	
*Watson.....C 1	1465a	35½x5½	35x5n	35x5n	W	FINAL DRIVE: —B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm, r—8 cyl., s—6 cyl., t—2 cyl.—all others are 4 cyl.												W
Watson.....N 3½	4250	1½x5½	30x5	30x10	W	r—8 cyl., s—6 cyl., t—2 cyl.—all others are 4 cyl.												W
Western.....W 1½	2450	1½x5½	30x3½	36x5k	W	d—Dual tires, k—pneumatic tires optional at extra cost, n—pneumatic tires, s—price includes several items of equipment, b—price includes body, *—express truck or delivery wagon, **—Canadian Make, tra—tractor.												W
Western.....L 1½	2550	3½x5½	36x3½	36x5k	W	n—pneumatic tires, s—price includes several items of equipment, b—price includes body, *—express truck or delivery wagon, **—Canadian Make, tra—tractor.												W
Western.....W 2½	3250	4½x5½	30x4	36x7	W	n—pneumatic tires, s—price includes several items of equipment, b—price includes body, *—express truck or delivery wagon, **—Canadian Make, tra—tractor.												W
Western.....L 2½	2450	1½x6	30x4	36x7	W	n—pneumatic tires, s—price includes several items of equipment, b—price includes body, *—express truck or delivery wagon, **—Canadian Make, tra—tractor.												W
Western.....W 3½	4000	1½x6	30x5	40x5d	W	n—pneumatic tires, s—price includes several items of equipment, b—price includes body, *—express truck or delivery wagon, **—Canadian Make, tra—tractor.												W
*White.....15	2400	3½x5½	34x5n	34x5n	B	n—pneumatic tires, s—price includes several items of equipment, b—price includes body, *—express truck or delivery wagon, **—Canadian Make, tra—tractor.												W

Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity
Allis-Chalmers.....G.P 6-12	\$250	2	Le.R.	4-3½x4½	Gas.	1	Fordson.....Ford 18	-18	\$395	4	Own	4-4x5	G.K	2	Oldsmar.....K 2½-5	2½-5	\$225	4	Own	1-5½x5½	Gas.	1	
Allis-Chalmers.....15-25	1185	4½	Midw.	4-4½x5½	Gas.	3	Frick.....A 12-20	12-20	4	Erd.	4-4 x6	G.K.	2-3	Pioneer.....G 18-36	18-36	....	4	Own	4-5½x6½	G.K.D	4	
Allis-Chalmers.....20-35	1885	4	Own	4-4½x6½	GorK	3-1	Frick.....C 15-28	15-28	4	Beav.	4-4½x6	G.K.	3-4	Pioneer.....C 40-75	40-75	....	4	Own	4-7 x8	Gas.	10	
Allis-Chalmers.....20-35	2085	4	Own	4-4½x6½	G	4	G.W.	20-30	4	Beav.	4-4½x6	K	4	Plowman.....A 15-30	15-30	1205	4	Buda	4-4½x6	G.K.	3-4		
Allwork.....2-G 14-28	1595	4	Own	4-4½x6½	GorK	3	Grain Belt.....A 18-30	18-30	2150	4	Wauk.	4-4½x6½	G or K	4	Reliable..... 10-20	10-20	300	4	Own	2-6 x7	Ker.	2	
Allwork.....2-G 14-28	1395	4	Own	4-5 x9	GorK	3	Gray.....F 20-36	20-36	1975	3	Wauk.	4-4½x6½	Gas.	4	Russell.....TB 12-24	12-24	1500	4	Own	4-4½x5½	G or K	2-3	
Aero-Trac 1921-22 3-6	385	4	Own	1-4½x5	Gas.	1	Gray.....G 22-44	22-44	2165	3	Wauk.	4-5 x9½	Gas.	4-5	Russell.....C 15-30	15-30	2200	4	Own	4-5 x9½	G or K	3-4	
Aultman-T. 15-30	1910	4	Clim.	4-5 x9½	G.K.D	4	Heider.....D 9-16	9-16	628	4	Wauk.	4-4½x6½	G.K.	2	Reliable..... 20-35	20-35	3000	4	Own	4-5½x7	G or K	4-5	
Aultman-T. 22-45	2810	4	Clim.	4-5½x8	G.K.D	6	Heider.....E 10-20	10-20	1720	4	Wauk.	4-4½x6½	G.K.	3	Russell.....E 15-35	15-35	1750	4	Own	4-5½x8	G.K.	4	
Aultman-T. 30-60	4010	4	Clim.	4-7 x9	G.K.D	9-10	Heider.....F 12-20	12-20	725	4	Wauk.	4-4½x6½	G.K.	3	Samson.....M 10-20	10-20	445	4	Own	4-4 x5½	G.K.	2	
Autonet. B-3 12-21	1250	4	Here.	4-4 x5½	Gas.	2-3	Heider.....G 12-20	12-20	1985	4	Wauk.	4-4½x6½	K.D.	2	Sandusky.....J 10-20	10-20	1250	4	Own	4-4½x5½	G.K.D	2	
Avery, SR. Cut-C 5-10	....	4	Own	4-3 x4	G.K.	....	Hart-Parr.....A 20	20	865	4	Wauk.	2-5½x6½	K.D.	3	Sandusky.....E 15-35	15-35	1750	4	Own	4-5½x6½	G.K.D	4
Avery, Cut-C 5-10	....	3	Own	6-3 x4	G.K.	2	Hart-Parr.....B 30	30	1045	4	Wauk.	2-6½x7	K.D.	3	Shelby.....B 1 15-30	15-30	150	3	B & S	1-2½x2½	G	1
Avery, Cut-C 5-10	....	4	Own	4-3 x4	G.K.	2	Hart-Parr.....C 135	135	1375	4	Wauk.	2-6½x7	K.D.	2	Shelby.....D 15-30	15-30	150	3	Beav.	4-4½x6	G.K.	3
Avery, Cut-C 5-10	....	4	Own	6-3 x4	G.K.	2	Heider.....D 9-16	9-16	628	4	Wauk.	4-4½x6½	G.K.	2	Shelby.....C 9-18	9-18	....	4	Wauk.	4-3½x5½	G or K	2
Avery, Cut-C 5-10	....	4	Own	2-5½x6	G.K.D	2-3	Heider.....E 10-20	10-20	1255	4	Wauk.	4-4½x6½	G.K.	3	Shelby.....B 15-30	15-30	150	3	Beav.	4-4½x6½	G.K.	3
Avery, Cut-C 5-10	....	4	Own	4-4½x6	G.K.D	4-5	Heider.....F 12-20	12-20	1985	4	Wauk.	4-4½x6½	G.K.	3	Shelby.....A 15-30	15-30	150	3	Beav.	4-4½x6½	G.K.	3
Avery, Cut-C 5-10	....	4	Own	4-6½x7	G.K.D	5-6	Leader.....B 12-18	12-18	685	4	Wauk.	2-6 x6½	(K,D)	2-3	Toro Cultivator 6 15-25	15-25	750	3	Le.R.	4-3½x6½	Gas.	2
Avery, Cut-C 5-10	....	4	Own	4-7 x8	G.K.D	5-6	Leader.....C 16-32	16-32	1725	2	Wauk.	2-6 x7	G.K.	3	Toro Tractor '22 6-10	6-10	495	3	Le.R.	4-3½x6½	Gas.	2
Avery, Cut-C 5-10	....	4	Own	4-7 x8	G.K.D	5-6	Leader.....D 16-32	16-32	1725	2	Wauk.	2-6 x7	G.K.	3	Toro Tractor '22 6-10	6-10	495	3	Le.R.	4-3½x6½	Gas.	2
Avery, Cut-C 5-10	....	4	Own	4-7 x8	G.K.D	5-6	Leader.....E 16-32	16-32	1725	2	Wauk.	2-6 x7	G.K.	3	Toro Tractor '22 6-10	6-10	495	3	Le.R.	4-3½x6½	Gas.	2
Avery, Cut-C 5-10	....	4	Own	4-7 x8	G.K.D	5-6	Leader.....F 16-32	16-32	1725	2	Wauk.	2-6 x7	G.K.	3	Toro Tractor '22 6-10	6-10	495	3	Le.R.	4-3½x6½	Gas.	2
Bates Mule H 15-25	....	4	Midw.	4-4½x5½	Gas.	3	Kinkade.....A 1½	1½	190	1	Own	1-3 x3	Gas.	....	Uncle Sam C20 12-20	12-20	1295	4	Weid.	4-4 x5½	G.K.	2-3
Bates Mule F 18-25	....	2	Midw.	4-4½x5½	Gas.	3	Kinkade.....B 12-20	12-20	1985	4	Own	4-4½x5½	G.K.D	2-3	Uncle Sam B19 20-30	20-30	1985	4	Beav.	4-4½x6	G.K.	3-4
Bates Mule G 25-35	....	2	Midw.	4-4½x6½	Gas.	4	Kinkade.....C 15-30	15-30	1750	4	Own	4-5½x8	G.K.D	4	Uncle Sam D21 20-30	20-30	1895	4	Beav.	4-4½x6	G.K.	3-4
Bear. 25-35	4250	2½	Ste.	4-4½x6½	Gas.	4	Kinkade.....D 15-30	15-30	1750	4	Own	4-5½x8	G.K.D	4	Utilitor.....501 40-65	40-65	295	4	Own	1-3½x4½	G	1	
Bear. 25-35	4250	2½	Ste.	4-4½x6½	Gas.	4	Kinkade.....E 15-30	15-30	1750	4	Own	4-5½x8	G.K.D	4	Utilitor.....501A 2½-4	2½-4	340	4	Own	1-3½x4½	G	1	
Bear. 25-35	4250	2½	Ste.	4-4½x6½	Gas.	4	Kinkade.....F 15-30	15-30	1750	4	Own	4-5½x8	G.K.D	4	Utilitor.....501A 2½-4	2½-4	340	4	Own	1-3½x4½	G	1	
Bear. 25-35	4250	2½	Ste.	4-4½x6½	Gas.	4	Kinkade.....G 15-30	15-30	1750</														

The Coachbilt

ANDERSON

ALUMINUM SIX



The world's lowest
priced six cylinder
car equipped with
a coachbilt alum-
inum body.

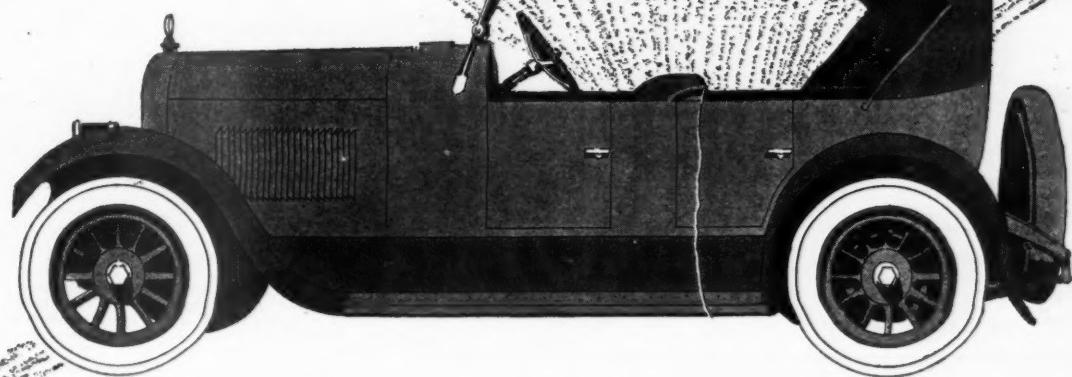
SPECIFICATIONS:

Coachbilt Anderson
 Aluminum Body
 6 Cylinder Red Seal
 Continental Motor
 Westinghouse Starting,
 Lighting, Ignition
 Borg and Beck Clutch
 Cord Tires
 Alemite Lubrication
 Snubbers
 Motometer
 Wind Shield Cleaner
 Patented Foot Dimmer for
 Headlights
 Averages 19 Miles per
 Gallon of Gas
 Wheelbase 115 inches

Touring Car

\$1195

Coach. \$1450
f. o. b. factory



Anderson Motor Company, Rock Hill, South Carolina

Specifications of Current Passenger Car Models

NAME AND MODEL	En-gine Make	Cylinders Bore and Stroke	WB	Tires	2- Pass.	5- Pass.	7- Pass.	Coupe	Sedan	NAME AND MODEL	En-gine Make	Cylinders Bore and Stroke	WB	Tires	2- Pass.	5- Pass.	7- Pass.	Coupe	Sedan	
Ambassador.....R	Cont.	6-3½x5½	136	33x5	b4500	\$4500	....	86500		Lincoln.....	Own.	8-3½x5	136	33x5	\$3800	b3800	\$3800	\$4400	\$4700	
American.....D-66	H-S.	6-3½x5	127	33x1½	b1885	1785	1850	....	2485	Locomobile.....	Own.	6-4½x5½	142	35x5	....	b7600	7600	10500	11000	
Anderson.....Aluminum 6	Cont.	6-3½x5½	114	32x4	1195	1495	1505	1995	1995	Marmon.....	34	6-3½x5½	136	32x4½	3385	b3185	3185	3985	4385	
Anderson.....Series 40	Cont.	6-3½x5½	120	33x4	1495	1495	1505	1995	1995	Maxwell.....	Own.	4-3½x4½	109	31x4	885	885	....	1235	1335	
Apperson.....8-21-S	Own.	8-3½x5	130	34x1½	2620	2645	3625	3695		McFarlan.....	1922	6-4½x6	140	33x5	6300	b6300	6300	7500	7500	
Auburn.....6-51	Cont.	6-3½x5½	121	32x4	1475	1475	2275	2345		Mercer.....	Own.	6-3½x5	132	32x4½	3750	3750	....	5000	5000	
Auburn.....6-51	Cont.	6-3½x5½	121	32x4½	....	n1995	1545	....		Mercer.....	Series 5	6-3½x5½	132	32x4½	3950	b3950	3950	4850	5250	
Barley.....	Cont.	6-3½x5½	118	32x4	1395	1395	1395	1850		Merit.....	Cont.	6-3½x4½	119	32x4	1895	1895	1895	1895	1895	
Bay State.....	Cont.	6-3½x5½	121	32x4	1800	1800	2400	2500		Mitchell.....	F-50	6-3½x5	120	32x4	a1490	1590	b1850	b2050	2275	
Biddle.....B1 & B5	Buda.	4-3½x5½	121	32x4	2950	b2950	....	3950	3950	Mitchell.....	F-50	6-3½x5	127	32x4½	....	1690	....	....
Brewster.....91	Own.	4-3½x5½	125	32x4½	5000	5000	7000	7000		Monroe.....	1922-S-9	4-3½x4½	115	32x3½	950	950	....	1585	1685	
Buick.....1923-34-5-6-7-38	Own.	4-3½x5½	109	31x4	865	885	u 725	1175	1395	Moon.....	6-40	Cont.	115	31x4	1295	1295	1785	1785	2785	
Buick.....1923-41-4-5-47	Own.	6-3½x5½	118	33x4	1175	1195	u975	1935	1985	Moon.....	6-58	Cont.	128	33x4½	1785	1785	1885n	1885n	2785	
Buick.....1923-48-9-50-4-55	Own.	6-3½x5½	124	34x1½	n1625v	n1675v	1435	1895	2195	Nash.....	691-96-97	Own.	6-3½x5	121	33x4	1210	1240	b1395n	....	2040
Cadillac.....61	Own.	8-3½x5½	132	33x5	3100	3150	3150	b3875	4100	Nash.....	692-94-95	Own.	6-3½x5	127	34x1½	....	1615n	1390	b1890	2190
Case.....X Cont.	6-3½x5½	122	32x4½	1750	1790	....	2550	2690	Nash Four.....	41-4	Own.	4-3½x5	112	33x4	915	935	....	a1385	1275k	
Case.....W Cont.	6-3½x5½	120	34x1½	2200	2250	2850	3250		National.....	BB	Own.	6-3½x5½	130	32x4½	a2475	b2475	2375	b3725	3825	
Chalmers.....1922	Own.	6-3½x5½	117	32x4	1185	1185	1595	2295		Noma.....	3C	Cont.	128	32x4½	2500	b2500	e2600	....	3500	
Chalmers.....1922	Own.	6-3½x5½	122	32x4	1315	1315	1315	1315		Noma.....	ID	Bea.	128	32x4½	3000	b3100	e3200	....	5500	
Chandler.....Six	Own.	6-3½x5	123	33x4	1495	b1495	1615	b1995	2295	Norwalk.....	430-KS	Lyc.	116	32x3½	....	1035	....	....	....
Chevrolet.....Superior	Own.	4-3½x4	102	30x3½	510	525	u425	b840	860	Oakland.....	6-44	Own.	6-2½x4½	115	32x4	975	995	b1165n	1445	1545
Chevrolet.....FB	Own.	4-3½x5½	110	33x4	865	885	....	1325	1395	Oakland.....	6-44	Own.	6-2½x4½	115	32x4	975	995	b1165n	1445	1545
Cleveland.....41	Own.	6-3½x5½	112	32x4	1085	n1095	n1280	1495	1535	Ogren.....	6 TD Luxe	Cont.	6-3½x5½	134	33x5	b3750	3750	3850	4500	4800
Cole.....890	Nort.	8-3½x5½	127½	33x5	2685	b2685n	2685	b3385	3685	Oldsmobile.....	43 A	Own.	4-3½x5½	115	32x4	955	975	b1075n	1475	1595
Columbia.....Elite	Cont.	6-3½x5½	115	32x4	1475	1475	b1475n	b1925	1995	Oldsmobile.....	46	Own.	8-2½x4½	122	33x4½	b1735	c1850	1735	....	2635
Columbia.....Light Six	Cont.	6-3½x5½	115	31x4	995	995	....	1365		Oldsmobile.....	47	Own.	8-2½x4½	115	32x4	1625	b1675n	1875	2025	2025
Comet.....C-53	Cont.	6-3½x5½	125	33x4½	....	1985	2085	2985		Overland.....	4	Own.	4-3½x5	100	30x3½	525	425u	795	875	875
Courier.....	Own.	6-3½x5½	116	32x4	a1395	1395	b1495n	2065	2165	Packard.....Single-Six	Own.	6-3½x5	126	33x4½	2485	2485	b2250	3175	3275	
Crawford.....22-6-60	Cont.	6-3½x5½	122½	32x4	3000	3000	3000	....	500	Packard.....Single-Six	Own.	6-3½x5	133	33x4½	u2350	2685	....	3525	3525	
Crawford-Dainger.....6-60	Cont.	6-3½x5½	135	33x5	....	n3500	....	....		Packard.....Twin-Six	Own.	12-3 x5	136	35x5	3850	3850	3850	5240	5400	
Daniels.....D-19	Own.	8-3½x5½	132	33x5	a4350	b4350	4350	5250	6000	Paige.....	6-44	Own.	6-3½x5	119	32x4	1465	1465	1290	1995	2245
Davis.....71	Cont.	6-3½x5½	115	31x4	1295	1295	1735	1795		Paige.....	6-66	Cont.	6-3½x5	131	33x4½	a2495	n2245	2195	3155	3155
Davis.....61-67	Cont.	6-3½x5½	120	32x4	1895	1595	b1695	2095	2195	Paterson.....	22-6-52	Cont.	6-3½x4½	120	32x4½	....	1390	1425	2395	2395
Dixie Flyer.....H-S-70	H-S.	4-3½x5	122	32x4	1175	1175	b1295	1515	1595	Peerless.....	23	Own.	6-3½x5	128	33x5	b2990	2990	b3400	3900	3900
Dodge Brothers.....	Own.	4-3½x5½	114	32x4	850	880	....	980b	1195	Pierce-Arrow.....	6-4	Own.	6-4 x5½	138	33x5	b5250	5250	6800	7000	7000
Dorris.....6-80	Own.	6-4 x5	132	33x5	3350u	b3050	3950	4985b	5750	Pilot.....	6-50	H-S.	6-3½x5	126	32x4½	2050	2050	2050	3000	3000
Dort.....19-14	D-Ly.	4-3½x5	108	31x4	885	885	....	1265	1385	Premier.....	6-6	Own.	6-3½x5½	126	32x4½	3150	b3100	3250	4300	5100
Driggs.....	Own.	4-2½x5½	104	30x3½	1275	1275	1750	1850	1975	Premocar.....	6-40-A	Falls.	6-3½x5½	117	32x4	1095	1095	....	1750	1825
Duesenberg.....Straight 8	Own.	8-2½x5	134	33x5	6500	6500	6750	7800	7800	R & V Knight.....	R	Own.	4-3½x5½	116	32x4	1665	1665	....	2385	2475
Du Pont.....A	Own.	4-3½x5½	124	32x4½	3000	3200	....	3800	4000	R & V Knight.....	J	Own.	6-3½x5½	127	32x4½	2475	2475	3015	3105	3105
Durant.....A-22	Cont.	4-3½x5½	109	31x4	n890	890	....	1355	1365	Reo.....	T6 & U6	Own.	6-3½x5	120	33x4	n1645	1485	b2355	2435	2435
Durant.....B-22	Anst.	6-3½x5½	123½	32x4½	1600	1650	....	2250	2400	Revere.....	C	Dues.	4-1½x6	131	32x4½	3200	3200	....	4000	4000
Earl.....40	Own.	4-3 x5½	112	32x4	1485	1095	950	b1395	1795	Rickenbacker.....	A	Own.	6-3½x5½	117	32x4	1485	1485	1885	1985	1985
Ecar.....K-4	Lyo.	4-3½x5½	118	33x4	1095	1095	n1095	135	135	Roamer.....	6-54-E	Cont.	6-3½x5½	128	32x4½	b2485	2485	a3285	3585	3585
Ecar.....7-R	Cont.	6-3½x5½	118	33x4	1395	1395	n1395	1975	2065	Roamer.....	6-54-E	Cont.	6-3½x5½	128	32x4½	b2750	2750	3585	3950	3950
Elgin.....K-1	Falls.	6-3½x5½	118	33x4	1125	1125	b1125	1125	1125	Roamer.....	4-75-E	Dues.	4-1½x6	128	32x4½	3785	3785	b3650u	....	b4650
Esex.....	Own.	4-3½x5½	108½	32x4	....	1045	....	1145b	1895	Roxon.....	125	Own.	4-3½x5	127	32x4	1090	1090	....	....	....
Ford.....	Own.	4-3½x4	100	30x3½	r319	s348	u285	580	645	Saxon.....	DP	Cont.	6-3½x4½	112	32x4	1195	1195	....	1795	1795
Fox.....	Own.	6-3½x5	132	32x4½	3900	3900	4900	4900		Sayers Six.....	L-2 & O-2	Lyo.	4-3½x5	108	30x3½	875	875	....	2645	2645
Franklin.....10-A	Own.	6-3½x4	115	32x4	1900	1950	u1750	2100	2250	Seneca.....	50 & 51	Cont.	4-3½x5	112	31x4	1095	1095	....	....	....
Gardner.....T-R & G	Lyo.	4-3½x5	112	32x4	895	895	....	1095	1345	Sperling.....	A	Supr.	4-3½x5	114	32x4	980	980	....	1685	1685
Grant.....	Walk'r	4-3½x5½	116	32x4	1385	1385	....	1895	1945	Standard.....	98	Own.	8-3½x5	127	32x4½	2150	b2395n	2395	2750	3200
Gray.....	Own.	4-3½x4	100	30x3½	400	400	....	700	700	Stanley.....	740	Own.	2-4 x5	130	32x4½	2700	2700	2700	3775	3950
H.C.S. Series 3	Weid.	4-3½x5½	120	32x4½	2475	2475	3250n	3250	3475	Stanwood Six.....	Cont.	6-3½x4½	118	33x4	1					